Overview

connects controller worlds

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connects controller worlds

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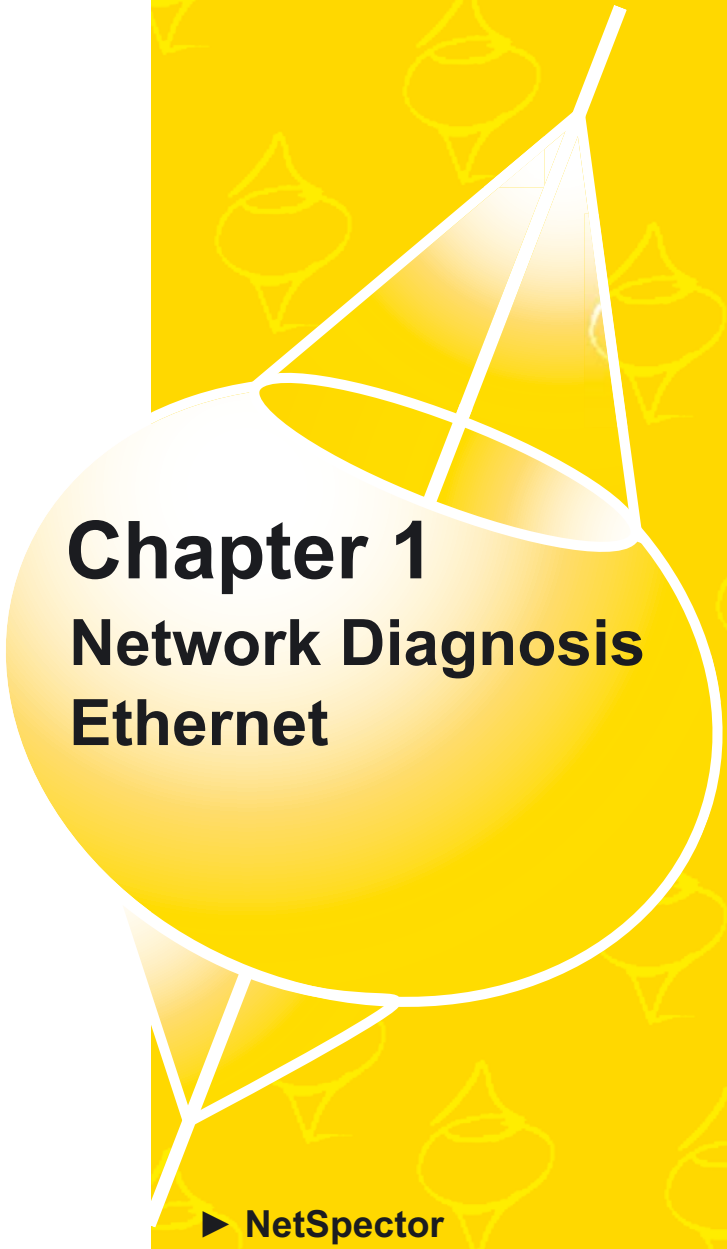
Industrial Networks for Automation Technology



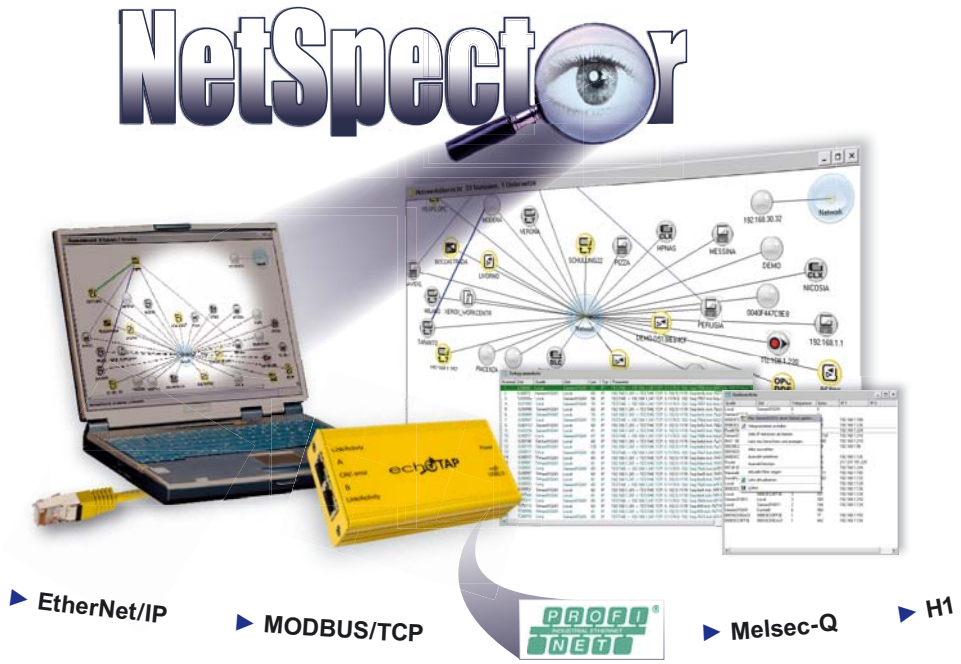
Chapter 1
Network Diagnosis Ethernet

- NetSpector
- echorecord
- echoTAP

Protocol Analysis in the Switched Ethernet

Remote Agents solution NetSpector ®

Full-duplex NEW on USB



► EtherNet/IP ► MODBUS/TCP ► Melsec-Q ► H1

INAT NetSpector is an Ethernet-Network analysis software. The Network Sniffer observes the network traffic, records the desired telegrams, decodes the transferred packages and makes the network transparent by that. Network problems can be located and fixed quickly. NetSpector is able to cope with common industrial protocols like no other analyzer could: S7, S5, RFC1006, Modbus on TCP, EtherNet/IP, H1, CLX etc.

NetSpector is designed modularly. Display unit and recording agent work separately and can be used in different locations. The display unit can be run on the local workstation while the recording takes place remotely on a switch. Problematic influences caused by intermediary active components (switch, router, bridge) are avoided by that. So protocol analysis does not represent an insurmountable task in Switched Ethernet also.

Features:

- The recording (capturing) and viewing of traffic in Ethernet LANs
- Protocol analysis of the recorded traffic
- Display of all stations involved in the communication
- Modular construction: Recording Agent and Viewer are deployable independent from each other ==> remote record, local view and analysis
- Significant statistics
- Analysis of communication relations
- Reliable information about current network traffic
- Search function
- High-resolution time base 10 µs
- Storage of users‘ profiles
- Statistics and graphics show network communication in multifarious ways. Clear and visual impression of the network
- Symbolic names of stations (MAC or IP)
- Coloured marking of the different kinds of telegrams
- Filters narrow the network traffic, so only suspicious network traffic is being focused. Through that errors can be located quickly
- Possibility of triggering certain events
- Variable sizes of the record buffer (ring buffer / batch buffer)
- Recordings can be saved on harddisk and be reimported later.

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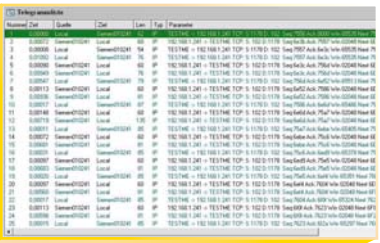
Netspector - achieve your goal in only 3 steps:

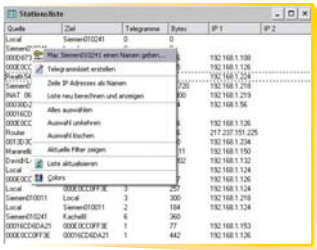
Step 1:
After starting NetSpector detects all stations taking part in telegram-traffic and shows them well aranged in the station list. Here you can see who communicates with whom (Source, Destination).

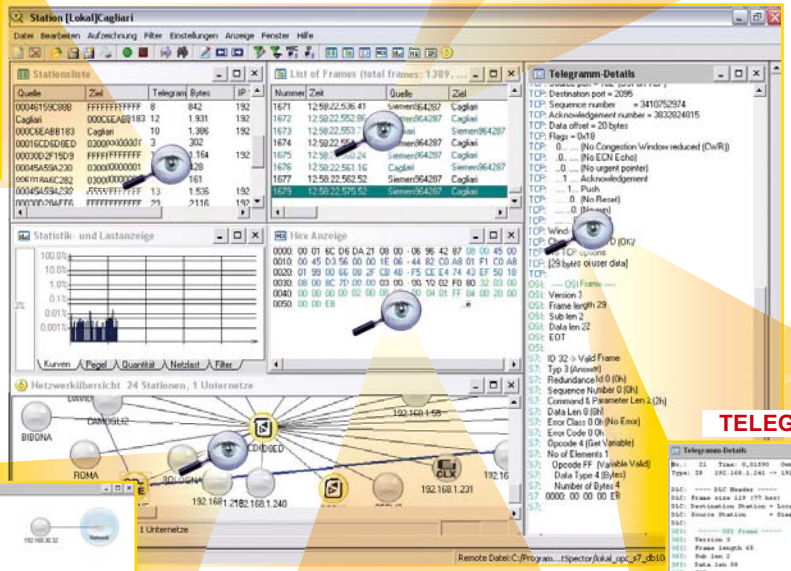
Step 2:
Stations that shall be analyzed more closely are being marked and by that a list of telegrams is being generated. Telegrams appear in chronological order. Their coloured layout supports your systematic search of single telegrams.

TELEGRAM LIST



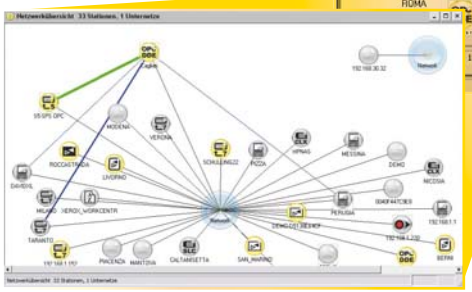
STATION LIST





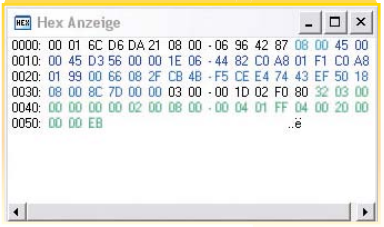
Step 3:
The selected telegram is being fully decoded and shown in detail in the protocol window. The content of the telegram can be displayed in Hex- or Ascii-Code if required.

NETWORK OVERVIEW



TELEGRAM DETAILS

HEX VIEW



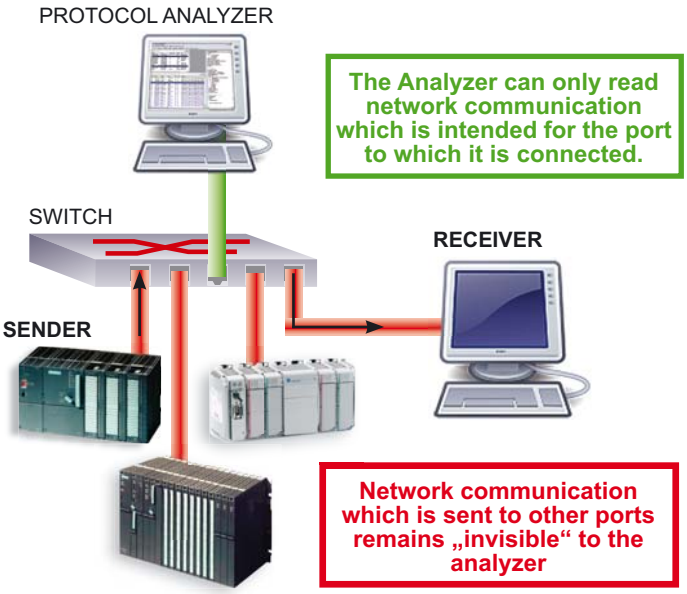
In that way you observe the station's communication and locate the source of interference or faulty telegrams. The entire recorded telegram traffic can be saved for later analysis.

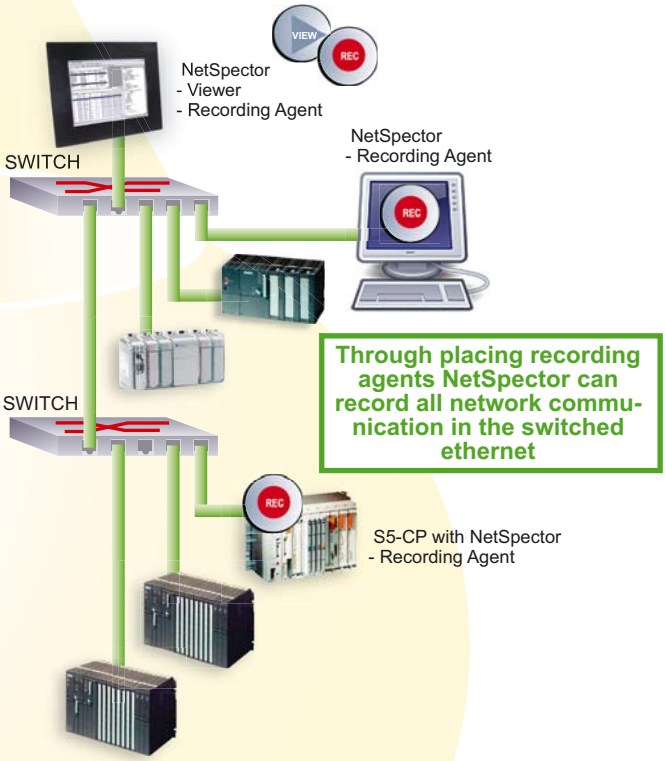
WINDOW:	DESCRIPTION:
Station Window	List of all stations participating in telegram traffic with display of source (sender of data), destination (receiver of data), number of sent and received telegrams, number of sent and received bytes, IP addresses of source and destination
Telegram Window	An overview of telegrams from the selected Station(s) with a view of source, destination, time, length and telegram type
Telegram Details	Detailed, decoded content of the selected telegram
HEX-View	Hex- and Ascii diagram of the selected telegram
TCP-Connectionlist	List of all recorded TCP/IP connections with view of the IP-adresses, MAC adresses and the port numbers of the sender and the receiver as well as the number of sent/received telegrams and bytes
H1-Connectionlist	List of all recorded H1 connections with view of the MAC adress and Ref IDs of the sender and receiver as well as the number of sent/received telegrams and bytes.
Statistics View	Statistics on network utilization, broadcast load, memory usage, etc. in different forms of diagram (curves, levels, lists, etc.)
Network Overview	Visualisation of all available stations in the network and their communication relations

Network Analysis in Switched Ethernet:

Problem: Switched Ethernet

Today's switched Ethernet networks make the LAN-Analysis difficult because the protocol analyzer faces - just like any other station - only unicast-frames, which are being forwarded to the port, as well as multicast- and broadcast-frames.
Only these frames can be recorded by the protocol analyzer. Data traffic, that the switch forwards to other ports, is not viewable for the protocol analyzer anymore.


PROTOCOL ANALYZER
The Analyzer can only read network communication which is intended for the port to which it is connected.
SWITCH
RECEIVER
SENDER
Network communication which is sent to other ports remains „invisible“ to the analyzer



Solution: NetSpector Remote Agents

The Networksniffer enables protocol analysis in the switched Ethernet from a central point. NetSpector is modularly designed: The display unit and the recording agent work independently from each other and are applicable in different locations.
The display unit is the user interface with which the data recording is controlled and the recorded data is shown. The Recording Agent is responsible for the actual recording (capturing). It is either installed on the same station on which the display unit is installed or - and that is its chief attraction - on a remote station.
The Recording Agent records the network communication on the remote station and, when necessary, sends it to the indication station. The display unit can be run on the local workstation while the recording takes place remotely on a switch.

Recording wherever you want

The NetSpector Recording Agent is applicable virtually anywhere:

- ► Already preinstalled on INAT Hardware (S5-TCP/IP, echolink, echochange...)
- ► on every Windows system
- ► on every Linux system
- ► additional systems on demand

Also avaible as hardware version **echorecord**

echorecord:

Echorecord is the hardware-version of the NetSpector recording-unit and is needed if there is no PC in the remote subnet or the installation of software is undesired.

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echoTAP:

Professional analyses require dedicated hardware.

echoTAP is a straight forward solution. In-Line it sees and monitors all 7 protocol layers.

The capture function merges the full-duplex data traffic via a USB 2.0 High Speed port (480 Mbps) in the analyzer.

echoTAP is invisible to the network and does not interfere in auto negotiation/speed or duplex settings.

The permanent network link feature guarantees permanent network connectivity and no package loss also when power fails or the USB port is disconnected.

- ► Full-Duplex Aggregation into USB 2.0
- ► Non Intrusive In-Line Monitoring
- ► Permanent Network Link guaranteed
- ► Monitoring for all Protocol Levels
- ► No Package Loss
- ► Time stamping
- ► Ultra compact, only 24x55x103 mm
- ► USB powered
- ► No adaptor required

Scope of Delivery:

- ► echoTAP
- ► USB Key with all echoTAP drivers
- ► Current version of the **NetSpector** on USB Key
- ► 1 USB cable; 1,8 m
- ► 1 RJ465 cable; 2 m

Supported protocols:

Data link-, network- and transport protocols (Layer 2 - 4)

- ▪ Ethernet
- ▪ VLAN
- ▪ IPv4/IPv6
- ▪ TCP
- ▪ UDP
- ▪ ICMP
- ▪ ARP/RARP

Session-, presentation- und application protocols (Layer 5 - 7)

- ▪ FTP
- ▪ Telnet
- ▪ SMTP
- ▪ DNS
- ▪ DHCP
- ▪ BOOTP
- ▪ HTTP
- ▪ POP3
- ▪ RFC1006 (ISO on TCP)
- ▪ Portmap
- ▪ NTP
- ▪ RPC
- ▪ SMB
- ▪ NetBIOS name
- ▪ NetBIOS data
- ▪ NetBIOS session
- ▪ IMAP
- ▪ SNMP
- ▪ mount
- ▪ NFS
- ▪ eDonkey

PLC protocols

- ▪ Modbus TCP
- ▪ INAT SPS-Header
- ▪ Melsec-Q
- ▪ NetLink
- ▪ NetLink Pro
- ▪ EtherNet/IP
- ▪ ENCAP
- ▪ CIP
- ▪ H1 (ISO)
- ▪ S5-AP
- ▪ S7
- ▪ ProfiNet

Other protocols

- ▪ Spanning Tree
- ▪ IPX

Order data:

NetSpector, incl. Ethernet Tap (echoTAP) full-duplex	Order no.: 100-2265-03
Additional modules for network version	
1 x Record License	Order no.: 100-2268-05
10 x Record License	Order no.: 100-2268-10
echorecord, hardware	Order no.: 200-6600-01

Stand: 02.2009

Chapter 2
Network Diagnosis PROFIBUS

- PB-T3
- BC-400

PROFIBUS Tester PB-T3

Precise Analysis of Signal Quality and Configuration

Finding Errors NEW easily

PB-T3

The PB-T3 PROFIBUS Tester is a universal measuring instrument for analysis, monitoring, error finding and maintenance of PROFIBUS systems. Typical operating faults for plants running PROFIBUS, such as station failure, communication errors or even plant shutdowns, are frequently due to the bus electrics and cabling. PB-T3 provides an overview of the signal conditions on the bus, thus helping users to quickly find and correct errors.

Measured Data/Functions

- Disturbance-free voltage range
  Overview measurement, logger measurement
- Signal shape
  Station-specific measurement with built-in oscilloscope
- Signal edges
  Quality of rising and falling edges
- Bus status
  Detection of bus activity, measurement of differential voltage when idle
- Bus cycle time
  Token rotation time of a master
- Error counter
  Detection of erroneous frames
- Topology scan
  Measurement of the line lengths between stations
- Multiple address detection
  Detection of multiple identical PROFIBUS addresses
- Master simulator
  Permits measurement without bus master, automatic station scan
- Trigger output
  Station-specific trigger signal for controlling an oscilloscope
- Report generator
  Creates a user-configurable test report

Technische Daten:

- Connection
  - PROFIBUS 2 x 9-pin female D-sub connector (also M12, via supplied adapter cable)
- Protocols
  - PROFIBUS DP and FMS
- Data transfer rates
  - 9.6 - 12000 kbits/s incl. 45.45 kbits/s, automatic recognition
- Measuring range
  - Typ. 0.4 ... 5 V, resolution: 50 mV, Signal sampling with 16 samples per bit
- Power supply
  - Via supplied wide-range power supply
- Dimensions in (W x H x D):
  - 109 x 35 x 143 in mm
- Temperature
  - Ambient: 5°C - +40°C
  - Storage: -20°C - +60°C

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Find Errors Easily

PB-T3 is quickly connected to any PC via USB. Besides automatically detecting the baud rate and the individual devices of the system to be analyzed, it determines the signal quality of each device on the bus. Thereby it also shows the signal shape with its built-in storage oscilloscope. PB-T3 also provides a master simulator which permits checking the PROFIBUS installation even without having the actual bus master in operation.

PB-T3 determines signal quality and network topology

The detection of multiple identical station addresses and the determination of the bus cycle times help to ensure the correct configuration of the system. In addition, PB-T3 can determine the topology of a plant, thereby localizing sources of error with exact position information.

Other convenient features include the comprehensive, automatically generated test report and the possibility to export the measurement results as CSV files and graphics for further processing, for example in MS Office programs.

Features:

- ▶ System Requirements
  - ▪ PC with Windows XP, Windows Server 2003, Windows 2000 or Windows ME/98
- ▶ PC Connection
  - ▪ USB 1.1
- ▶ Oscilloscope
  - ▪ Trigger output galvanically isolated, BNC jack

Everything is always at hand in the practical service case

Scope of Delivery:

PB-T3 hardware, wide-range power supply, tester software on CD, user manual and a comprehensive range of accessories in a handy carrying case.

Order Data:

PB-T3	Order no.: 500-PB-T3

Stand: 02.2009

PROFIBUS Protocol Analyzer

Universal Tool for Analyzing PROFIBUS Networks

Protocol analysis NEW on both sides

The bus✓check PROFIBUS Protocol Analyzer is an indispensable tool for analyzing and optimizing communication in PROFIBUS networks. It is ideally suited for continuously monitoring a network, detecting hidden errors early on, optimizing data throughput and analyzing configuration errors. The tool is connected to the PROFIBUS network via the PROFIBUS Probe USB interface, which guarantees easy mobile use as well. An optional second connector for MBP physics enables a direct link to PROFIBUS PA networks. This means that both sides of a segment coupler can be analyzed and monitored at the same time. A receiver circuit which has been optimized for diagnostic purposes allows errors to be detected on the level of bits, bytes and telegrams.

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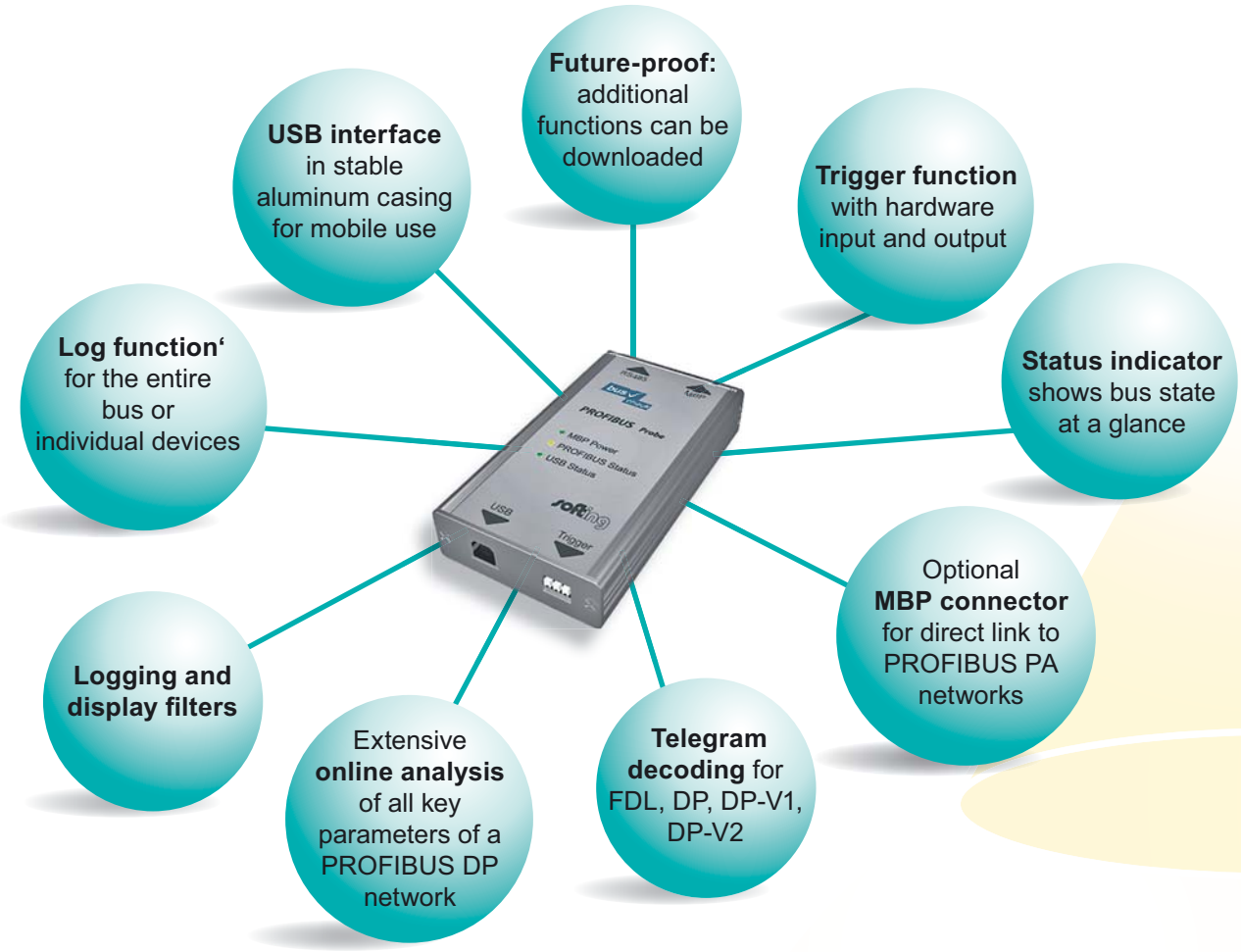
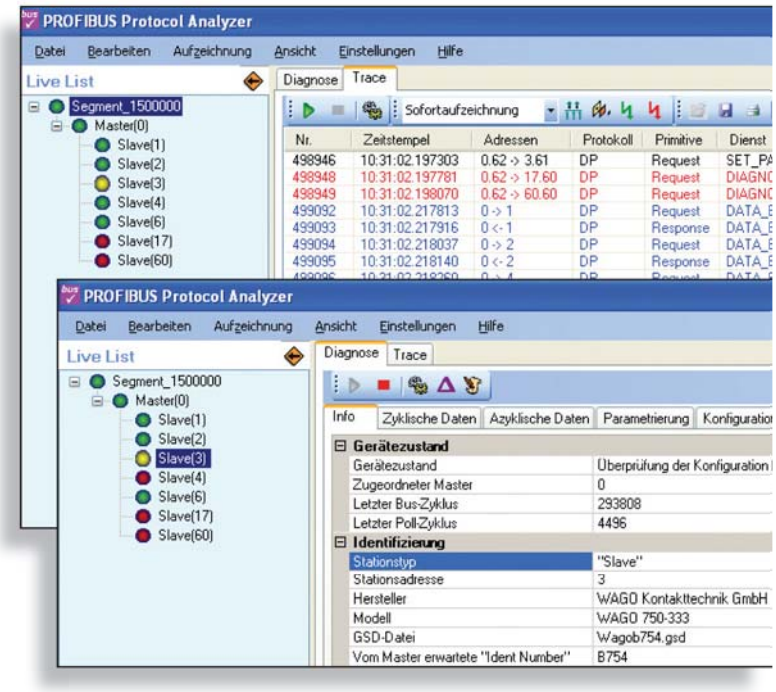
Your Advantages:


Future-proof: additional functions can be downloaded
USB interface in stable aluminum casing for mobile use
Trigger function with hardware input and output
Log function' for the entire bus or individual devices
Status indicator shows bus state at a glance
Optional **MBP connector** for direct link to PROFIBUS PA networks
Logging and display filters
Extensive **online analysis** of all key parameters of a PROFIBUS DP network
Telegram decoding for FDL, DP, DP-V1, DP-V2

		PROFIBUS Protocol Analyzer
Live List		• Live list displayed as tree with master-slave assignment • status indicator (traffic light) for clear view of communication status • matrix for displaying relevant parameters (e.g., repeat telegrams) for all devices
Online diagnosis	On the bus level: For each master: For each slave:	• target rotation time, errors in bits, bytes and telegrams • duration of cyclic data exchange, idle time 1, idle time 2, slot time • communication status • assigned master • identification number • station delay time • I/O data with configured and actual length • parameterization data • configuration data • diagnosis messages (circular buffer) • statistics on DP-V0 services • negative and faulty responses • repeat telegrams for each polling cycle and overall
Telegram logging		• Immediate logging in circular buffer with storage capability • long-term logging in files
Logging filters, display filters		• Filtering by station addresses • FDL telegram formats • faulty telegrams • repeat telegrams • FDL services • DP, DP-V1 and DP-V2 services
Triggers		• Triggering by station addresses • FDL telegram formats • faulty telegrams • repeat telegrams • FDL services • DP, DP-V1 and DP-V2 services • hardware trigger input and trigger output (in preparation)
Telegram display		• Decoding for FDL, DP, DP-V1, DP-V2 • display color can be freely selected for each service • time stamp, either absolute or time since start of measurement as well as telegram intervals and telegram pauses
Languages		• English, German
System Requirements		• PC/notebook with Windows 2000 or Windows XP, at least 1 GHz • USB interface

Online Diagnosis

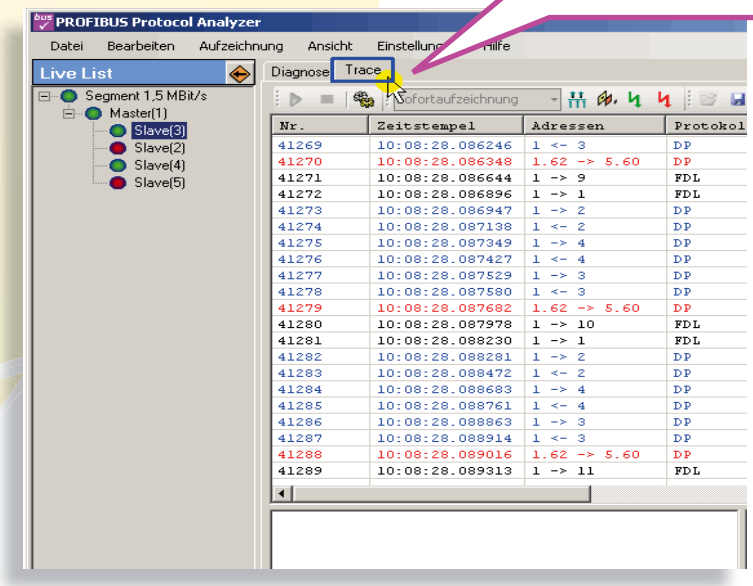
A live list (list of all active stations on the bus) in the form of a tree structure displays the communication status of each deviceon PROFIBUS using a status indicator (traffic light with red/yellow/green) so that the bus state can be evaluated at a glance. An expanded live list in matrix form displays a selectable parameter for every single device. The extensive online diagnosis function continually records all the significant parameters of a PROFIBUS DP system and displays them for each device. Important events are recorded in a log and displayed for the entire bus or individual devices.



Telegram Logging

Of course, the Protocol Analyzer also offers „traditional“ telegram logging and display in two different modes of operation. With „immediate logging“, the logged telegrams are managed in the memory as a circular buffer so it is possible to interact with them rapidly. With „long-term logging“, the telegrams are continuously stored in files to be analyzed later.

Complete telegram logging: In trace mode, telegrams are displayed as an overview (one telegram per line), as well as in completely decoded form.



	PROFIBUS Probe
PROFIBUS RS485 interface	9-pin D-sub connector, galvanic isolation, supply for active cable 9.6, 19.2, 45.45, 93.75, 187.5, 500, 750 KBit/s, 1.5, 3, 6, 12 MBit/s
PROFIBUS MBP interface **(BC-450-PB only)**	3-pin screw terminal, galvanic isolation, bus-powered Medium Attachment Unit 31,25 KBit/s
USB interface	Version 2.0, high-speed (480 Mbit/s) and full-speed (12 Mbit/s) with automatic detection Connector: USB Type B and USB cable A-B; Functionality: USB device
External trigger interface	Output: OpenCollector (active low); input: TTL, voltage-proof to 24 V
Displays (LEDs)	USB status, PROFIBUS status, MBP bus power (only with BC-450-PB)
Power supply	5 V (from USB), < 300 mA
Temperature range	Operation: 0 °C … +55 °C // Storage: - 20 °C … + 70 °C
Casing, dimensions in mm, weight	Aluminum, 69 x 24 x 124 (W x H x D), approx. 200 g
Certifications	CE, FCC
Protection class	IP20

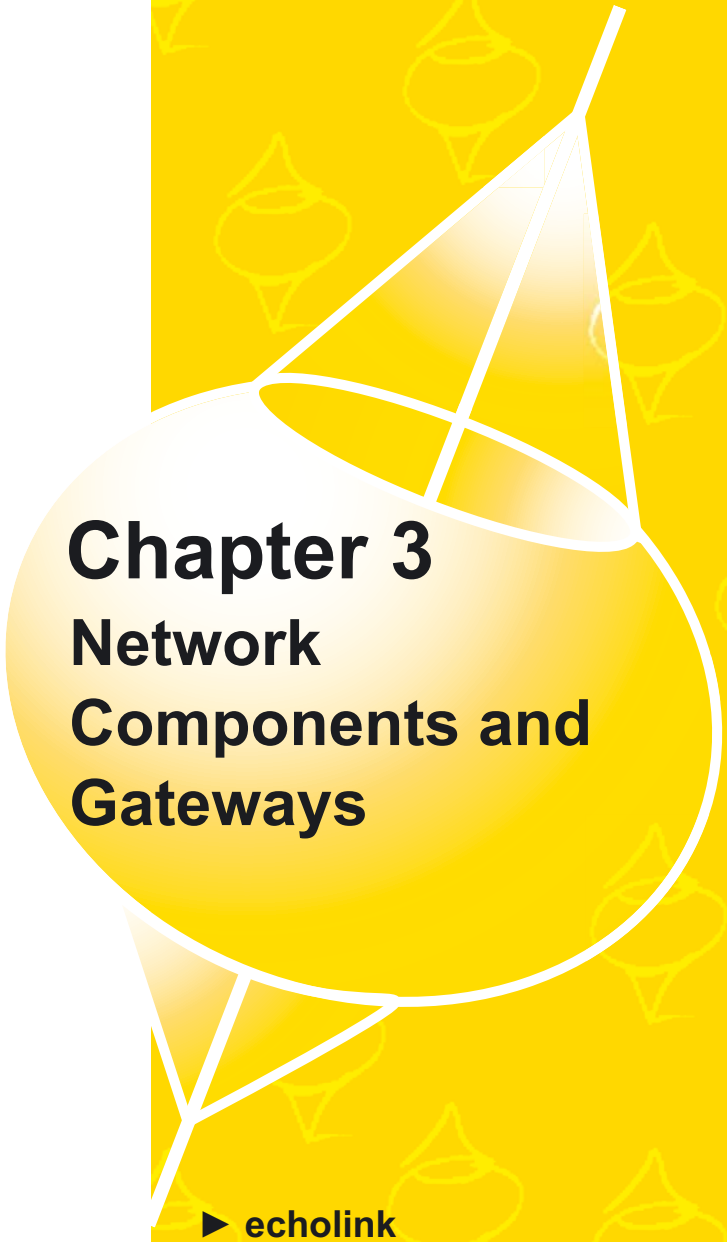
PC with
PROFIBUS Analyzer

Stand: 02.2009

Order Data:

BC-400-PB	with RS485 interface	Order no.: 500-BC-400-PB
BC-450-PB	with RS485 interface and MBP interface	Order no.: 500-BC-450-PB

Included in Package: bus check PROFIBUS Probe with RS485 interface and optional MBP interface, USB cable (3 m), CD with bus check PROFIBUS Protocol Analyzer and manual



Chapter 3
Network Components and Gateways

- ► echolink
- ► echochange
- ► echoS7
- ► S5-TCP/IP 100
- ► X5/X7 CPU
- ► IBHLink

Serial to Ethernet converter

networking S5|S7 with INAT Redundancy

echolink is a serial to Ethernet converter that enables serial devices without a network interface, to communicate in the world of Ethernet.

Regardless of the type of serial interface: RS232, RS422, RS485, TTY (20 mA), MPI or PPi – with echolink nearly all serial industrial devices become network-compatible and are ready for remote maintenance.

With its diversity of protocols echolink is more than just a „simple“ Serial to Ethernet converter. Besides transport protocols echolink handles the corresponding application protocols is able to decode them completely. In that way each of the listed serial protocols can be converted into every single Ethernet protocol. That makes numerous applications possible: communication between the different controller worlds (Siemens - Rockwell - Schneider etc.), visualization of process data, PLC programming etc.

Technical data

▶ **Ethernet protocols**
- S7 protocol
- S5 AP
- Modbus on TCP
- ISO on TCP (RFC 1006)
- PLC Header
- TCP / UDP
- ISO (H1)
- IP
- Send/Receive (raw)

▶ **Serial protocols**
- AS511 (Simatic S5-PG)
- MPI (Simatic S7)
- PPI (Simatic S7-200)
- RK512, 3964(R) (Simatic etc.)
- Modbus RTU (Modicon, Schneider etc.)
- Telnet
- NITP / K-Sequence (Siemens TI)
- optional ABC (Klöckner-Moeller IPC)

▶ **Ethernet interface**
- 2 x TP (RJ45), 10/100 Mbps

▶ **Serial interface**
Up to 5 serial interfaces, according to requirements:
- RS232
- RS422
- RS485
- TTY (20mA)
- MPI

▶ **Power supply**
- 24 V DC, ca. 1,1A

▶ Dimensions [in mm]
- 110 x 120 x 120

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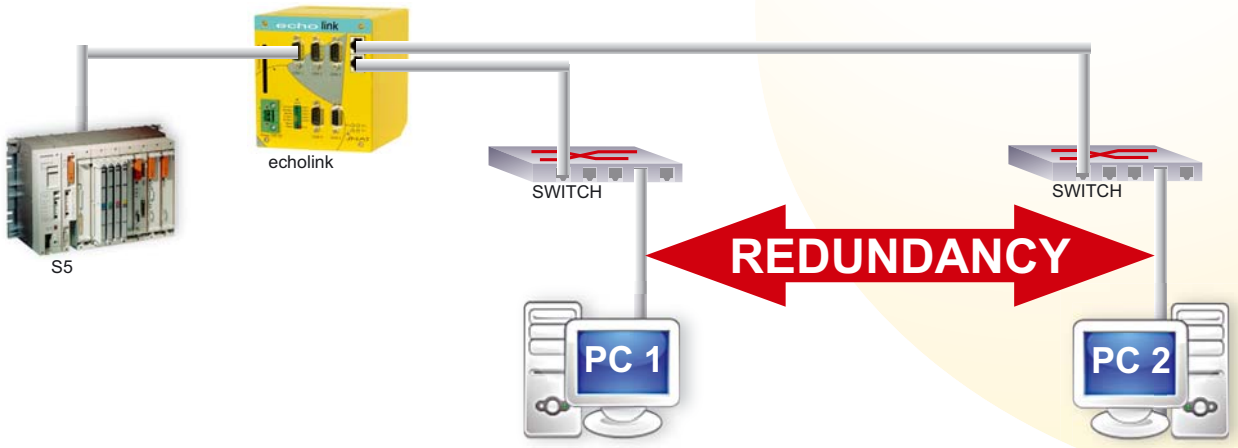
Special features:

- **Protocol diversity**
  - Data conversion Serial ↔ Ethernet
  - Connects different controller worlds
  - One device for different protocols
- **Ethernet interface for**
  - S7 PLCs with MPI/PPI interface
  - S5 PLCs and programming devices
  - Serial Modbus devices
  - All devices with RS232/RS422/485 interface e.g. scanner, scales
  - IPC 620 PLC (Klöckner-Moeller) via CIM interface
- **Echoaktiv function**
  - Active initiating of jobs
  - Data transfer between PLCs with minimal changes in program syntax
- **Webserver**
  - Access process data via web browser
- **Multi protocol**
  - 16 connections per Com Port simultaneously
- **Programming**
  - S5/S7 programming via Ethernet (except for S7-200)
  - With S5/S7 for Windows and with STEP® 5 / STEP® 7
  - Softnet® is no longer required, since VCOM is included in the scope pf supply
- **Telnet**
  - To controls with unknown protocol
  - Frames are completely transferred
- **Easy parameterization**
  - Online via IP
  - Online via H1
  - Serial
  - Offline for later transmission
- **Network analysis**
  - NetSpector Recording Agent is included in the scope of supply of the echolink
  - echolink communication frames can be captured
  - Network version of NetSpector required for visualization
- **Redundancy function**

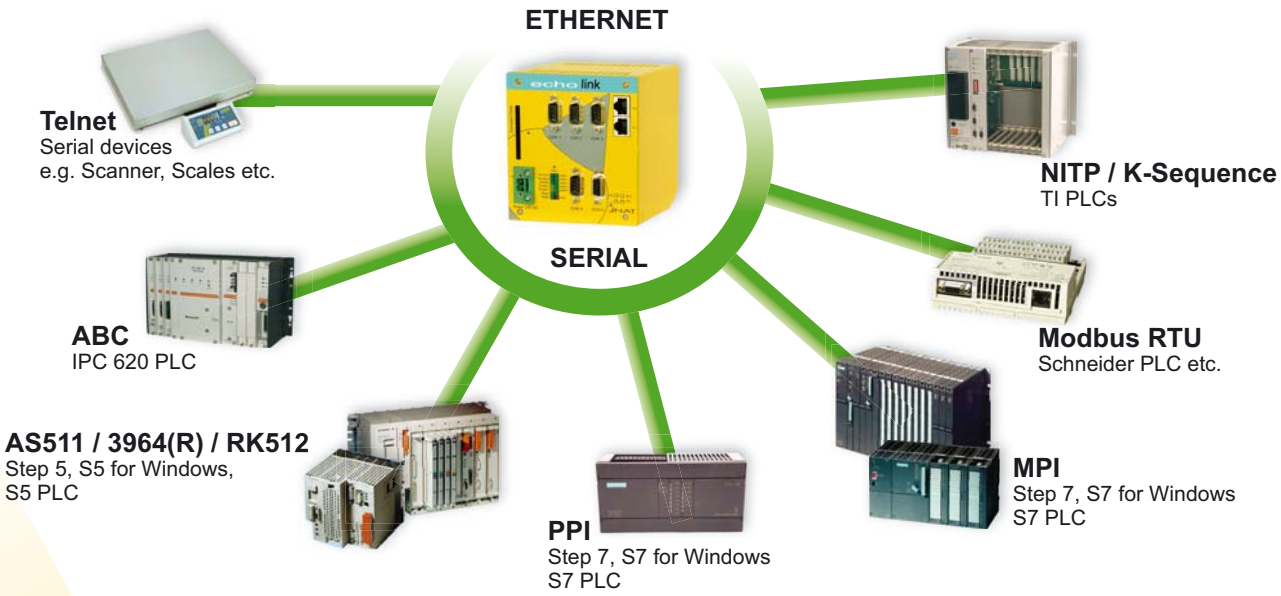
Example: INAT redundancy



Areas of application:

Devices with serial interface can be connected directly to the Ethernet.

- Integration of older systems and devices without Ethernet interface into the network
- Connecting serial Modbus devices via Ethernet
- Remote maintenance of PLCs
- OPC and DDE communication (e.g. visualization, measurement data logging, statistics etc.)
- PLC programming via Ethernet
- Communication between different controller worlds



Order data – echolink:

echolink

- ► including top-hat rail adapter
- ► including VCOM for programming via Ethernet
- ► including NetSpector Recording Agent

echolink basic	Order no.: 200-6500-01
Adapter for S7-300 rail mounting	Order no.: 700-5600-01
Serial protocol for IPC PLCs	Order no.: 200-6560-01
Connector power pack, 24V DC, EURO	Order no.: 700-5596-01

Note: A connector power pack is not included in the delivery.
If necessary order it separately.

Interface modules for echolink basic:

echolink basic is not equipped with interface modules. Up to 5 interface modules can be mounted. They are free to choose except for the following restrictions:

Interface modules for echolink basic:

1 x RS232	Order no.: 200-6581-01	**MPI**	Order no.: 200-6580-01
2 x RS232	Order no.: 200-6581-02	**1 x RS422 non-floating**	Order no.: 200-6583-01
3 x RS232	Order no.: 200-6581-03	**2 x RS422 non-floating**	Order no.: 200-6583-02
4 x RS232	Order no.: 200-6581-04	**3 x RS422 non-floating**	Order no.: 200-6583-03
5 x RS232	Order no.: 200-6581-05	**4 x RS422 non-floating**	Order no.: 200-6583-04
1 x TTY (20mA)	Order no.: 200-6582-01	**1 x RS485 non-floating**	Order no.: 200-6585-01
2 x TTY (20mA)	Order no.: 200-6582-02	**2 x RS485 non-floating**	Order no.: 200-6585-02
3 x TTY (20mA)	Order no.: 200-6582-03	**3 x RS485 non-floating**	Order no.: 200-6585-03
4 x TTY (20mA)	Order no.: 200-6582-04	**4 x RS485 non-floating**	Order no.: 200-6585-04
5 x TTY (20mA)	Order no.: 200-6582-05		

- ► A maximum number of two MPI interfaces
- ► A maximum number of four RS485 interfaces is possible
- ► With one RS422-/RS485-/TTY interface a maximum number of two RS232 interfaces is possible
- ► Combination of RS422-, RS485- and TTY combination is not possible

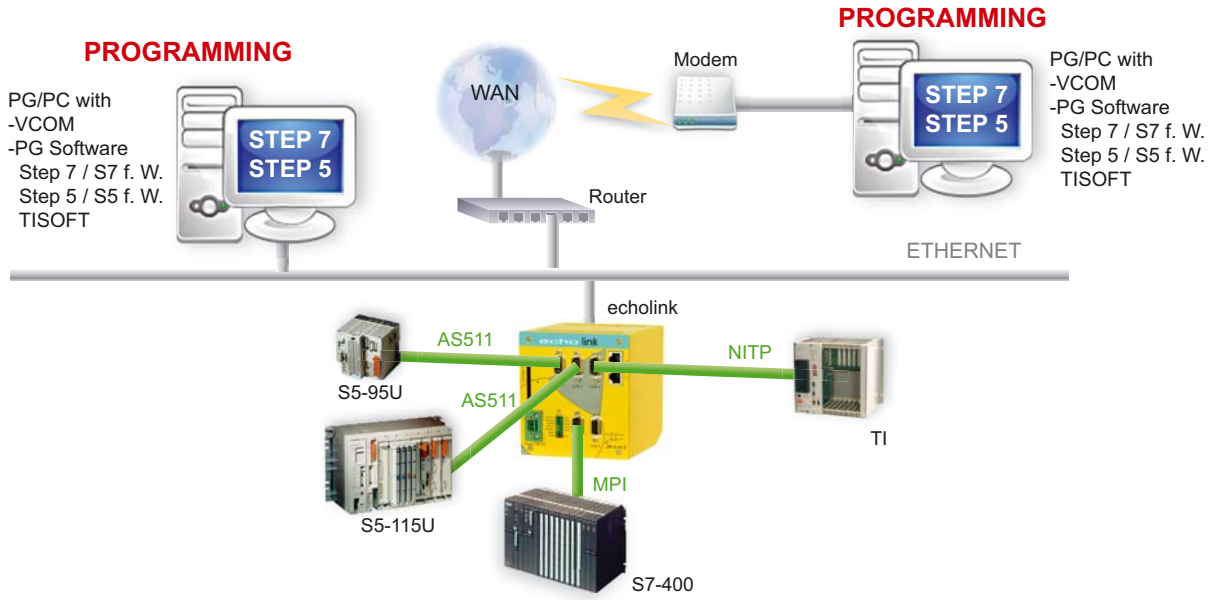
Additional change of port	Order no.: 200-5590-01

Note:
For additional change please send the echolink device (freight prepaid) back to INAT.
A flat rate plus the price for the new modules will be charged.

Examples of use:

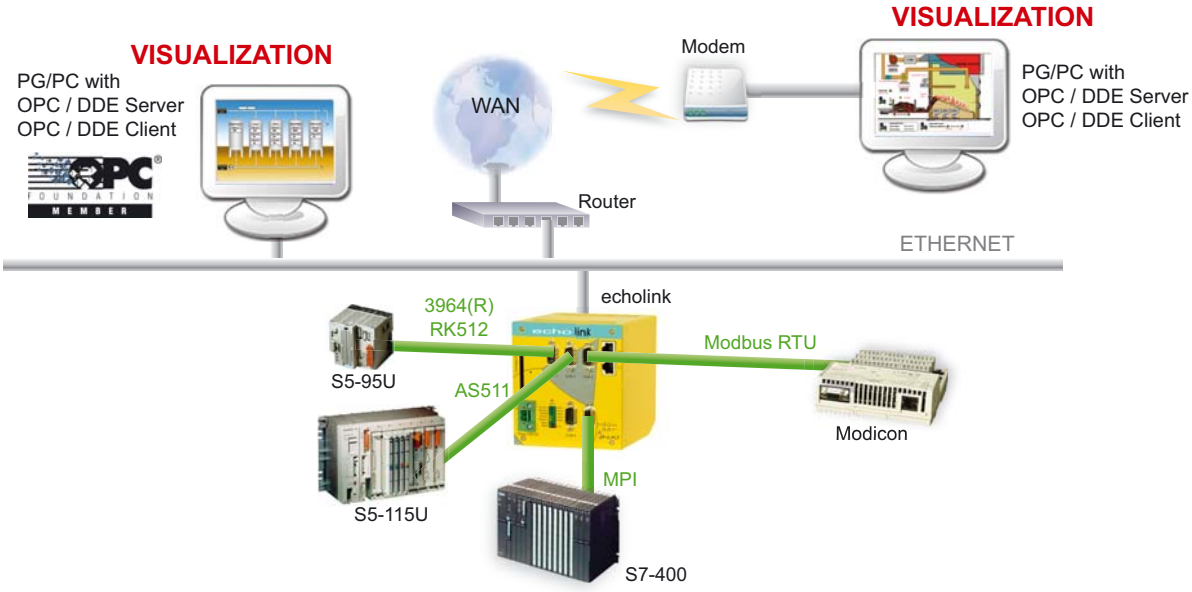
1. Programming

Programming Simatic® S7 and S5 PLCs via LAN and WAN.



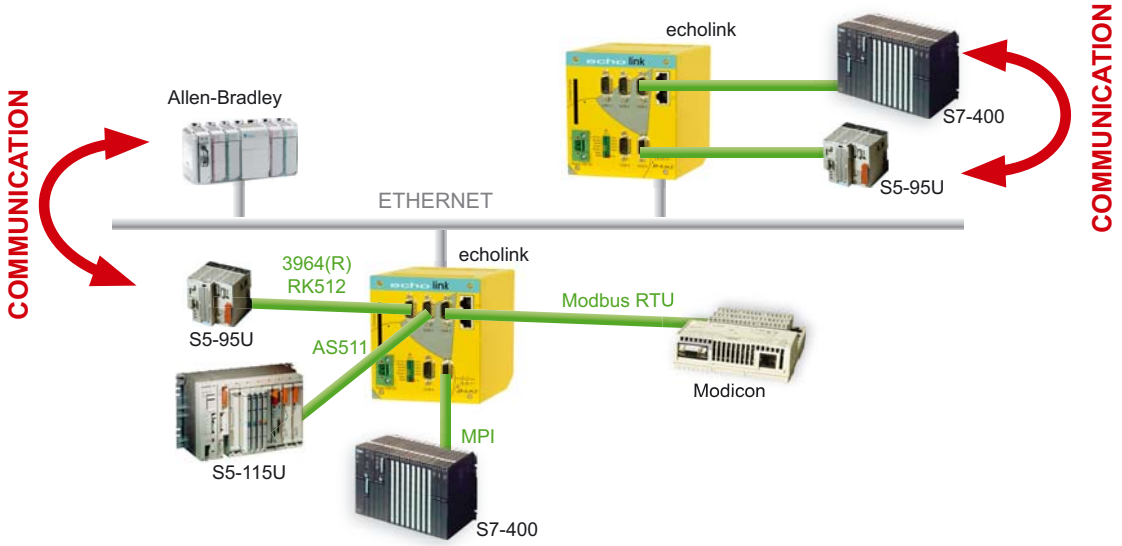
2. Visualization

Visualization, measurement data logging, statistics etc. via LAN and WAN.



3. Communication between controllers

Communication between PLCs via LAN and WAN.
Communication between two devices serial connected with echolink.



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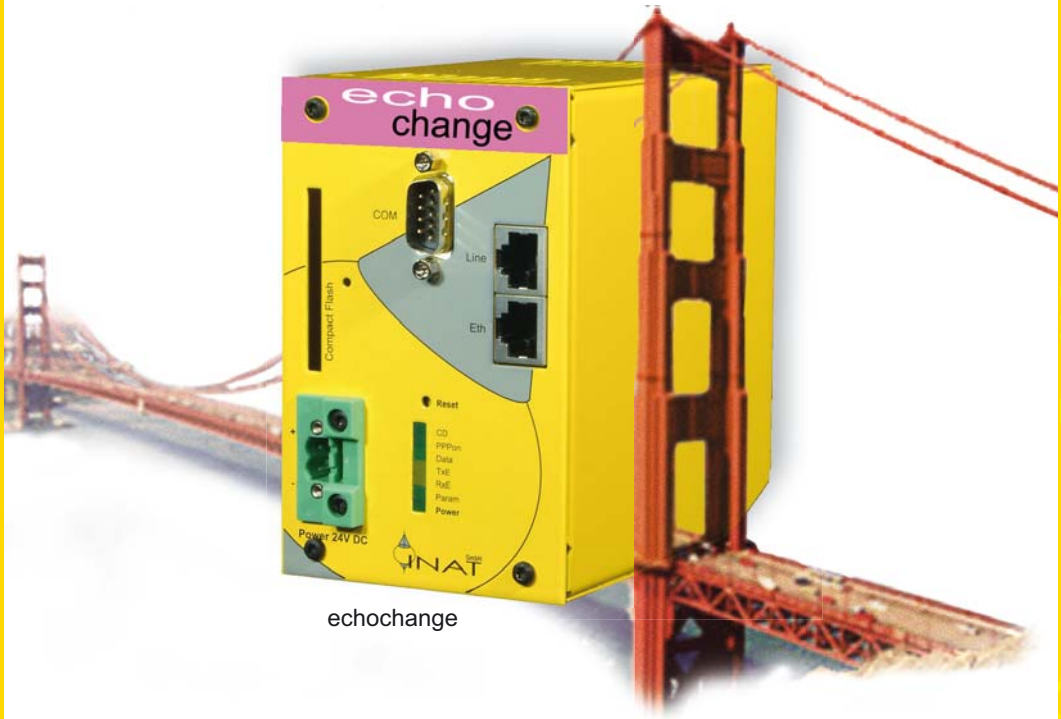
Ethernet Gateway

echochange connects Ethernet worlds



echochange

More and more Ethernet is being used in industry. Serveral protocols based on Ethernet are available: ISO (H1), ISO on TCP (RFC1006) or EtherNet/IP. Although these protocols are similar, communication between the corresponding networks is not that simple.

Echochange provides the solution: This produces „relationships“ between plants that were previously incompatible. The gateway may be configured locally or remotely and supports up to 30 active connections. The configuration software provides comprehensive diagnosis functions.

Special Features:

- Connects different controller worlds
  - Siemens (S7, S5)
  - Rockwell Automation (Allen-Bradley)
  - Schneider Electric (Modicon)
- Separated Ethernet networks are connected via specific parameterized connections
- Connection of TCP/IP computers with ISO (H1) networks
- Remote maintenance of PLCs in an ISO (H1) network via TCP/IP
- Gateway between separated networks (protocols run on the different media)
- Converter in a heterogeneous network (protocols run on the same medium)
- Easy configuration: Online via IP or ISO (H1), serial or offline for later transfer

Technical Data:

- Ethernet Interfaces
  - 2 x TP (RJ45), 10/100 Mbps
- Transport Protocols
  - TCP/IP
  - RFC1006 (ISO on TCP)
  - TCP/IP with PLC Header
  - ISO (H1)
- Application Protocols
  - Send / Receive (raw data / socket)
  - Modbus on TCP
  - optional:
    - EtherNet/IP (Allen-Bradley)
    - AB Ethernet (SLC 500, PLC-5)
- Serial Interface
  - 1 x RS232, for serial parameterization
- Aktive Connections
  - 10 (upgradeable to 30)
- Power Supply
  - 24 V DC, ca. 0,8A

Connecting simply Ethernet worlds

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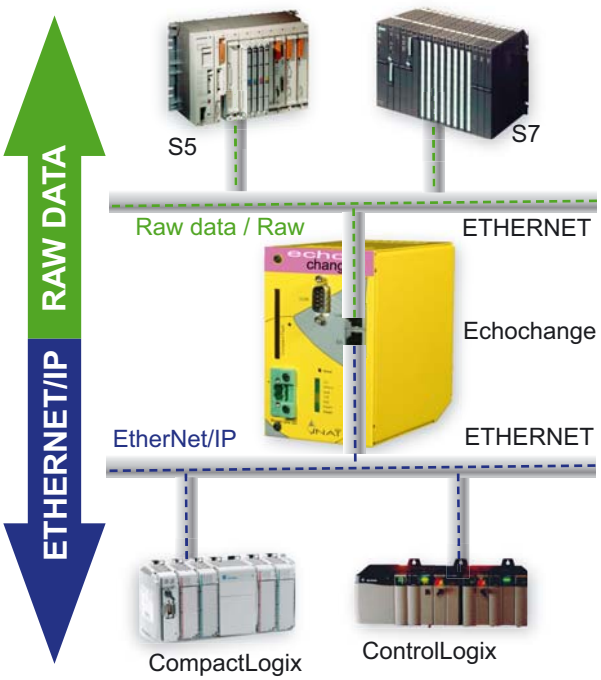
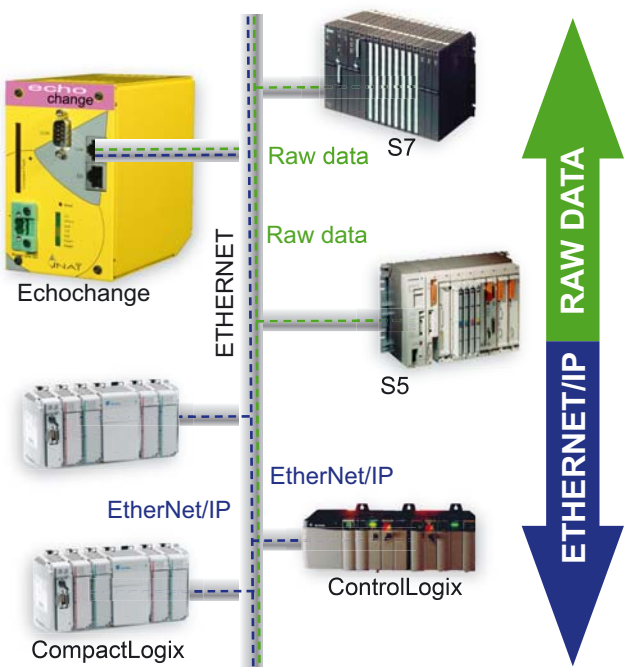
Examples of use:

Conversion of application protocols: Raw Data ↔ EtherNet/IP

TWO SEPARATED NETWORKS

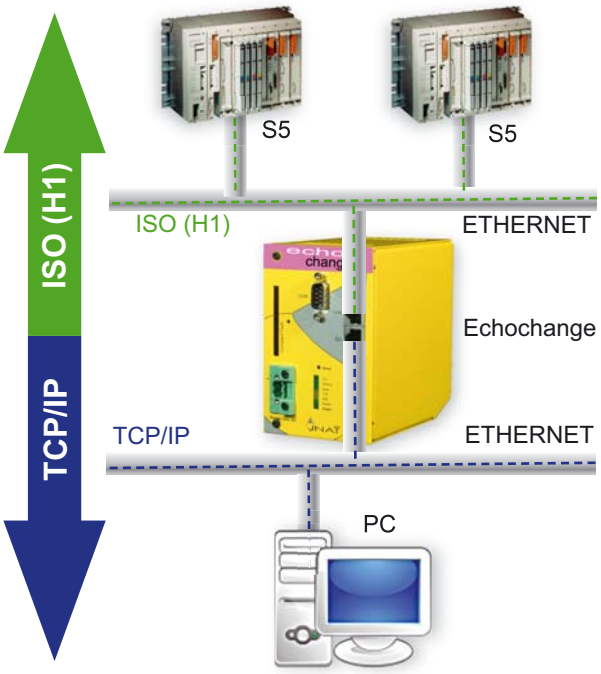


ONE HETEROGENEOUS NETWORK

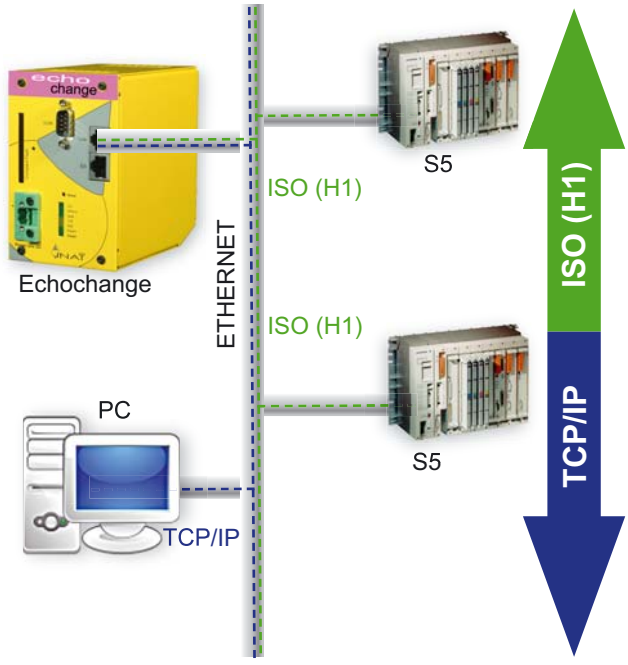


Conversion of transport protocols: TCP/IP ↔ ISO (H1)

TWO SEPARATED NETWORKS



ONE HETEROGENEOUS NETWORK



Order data:

echochange (10 connections)	Order no.: 200-6000-01
echochange (30 connections)	Order no.: 200-6000-30
Upgrade 10 → 30 connections	Order no.: 200-6000-Upg
Rockwell AB protocols	Order no.: 200-6100-01
Connector power pack	Order no.: 700-5596-01

Note: A connector power pack in not included in the delivery.
If necessary order it separately.

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MPI/Profibus Ethernet converter

networking S7 with INAT redundancy

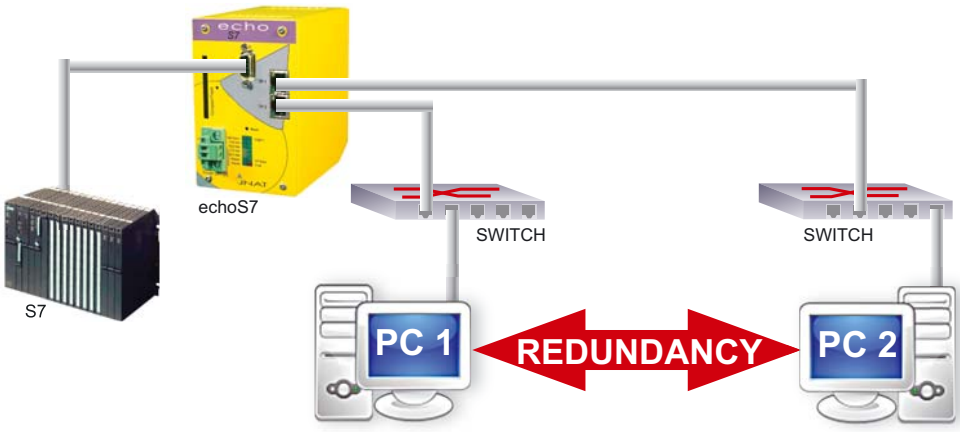
echoS7 connects each MPI / Profibus device to the Ethernet.

echoS7

Special features:

- **Protocol diversity**
  - Data conversion Serial ↔ Ethernet
- **Ethernet interface for**
  - S7 PLCs with MPI interface
- **Echoaktiv function**
  - Active initiating of jobs
  - Data transfer between PLCs without much interference in the program syntax
- **Web server**
  - Access process data via web browser
- **Programming**
  - S7 programming via Ethernet with S7 for Windows and with STEP® 7
  - Softnet not required by the included VCOM
- **Easy parameterization**
  - Online via IP
  - Online via H1
  - Offline
- **Redundancy function**
  - Heightened plant availability through the simply redundancy in echoS7

Web server integrated



Example: INAT redundancy

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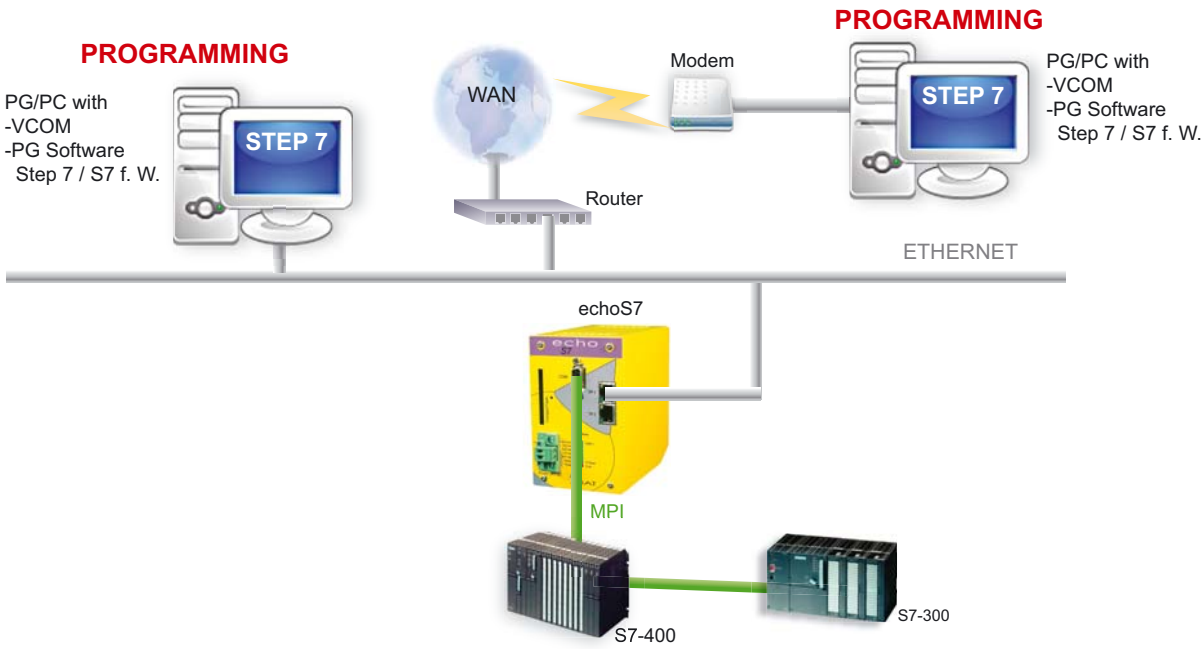
Application areas:

MPI partners can access directly to the Ethernet via echoS7.

- Remote maintenance of PLC
- OPC and DDE communication (e.g. visualization, measurement data logging, statistics etc.)
- PLC Programming via Ethernet



Example of use:
Programming of Simatic® S7 via LAN and WAN.

Technical data:

- **Ethernet protocols**
  - S7 protocol
  - ISO on TCP (RFC 1006)
  - SPS-Header
  - TCP / UDP
  - ISO (H1)
  - IP
  - Send/Receive (raw data / socket)
- **Serial protocol**
  - MPI (Simatic S7)
- **Ethernet interface**
  - 2 x TP (RJ45), 10/100 Mbps
- **Serial interface**
  - 1 x MPI
- **Power supply**
  - 24 V DC, ca. 1,1A
- **Dimensions [in mm]**
  - L = 76, D = 120, H = 120

Order data – echoS7:

- including top-hat rail adapter
- including VCOM for programming via Ethernet
- including NetSpector Recording Agent

echoS7	Order no.: 400-6100-01
Adapter for S7-300 rail mounting	Order no.: 700-5600-01
Connector power pack, 24V DC, EURO	Order no.: 700-5596-01

Note: A connector power pack is not included in the scope of delivery. If necessary order it separately.

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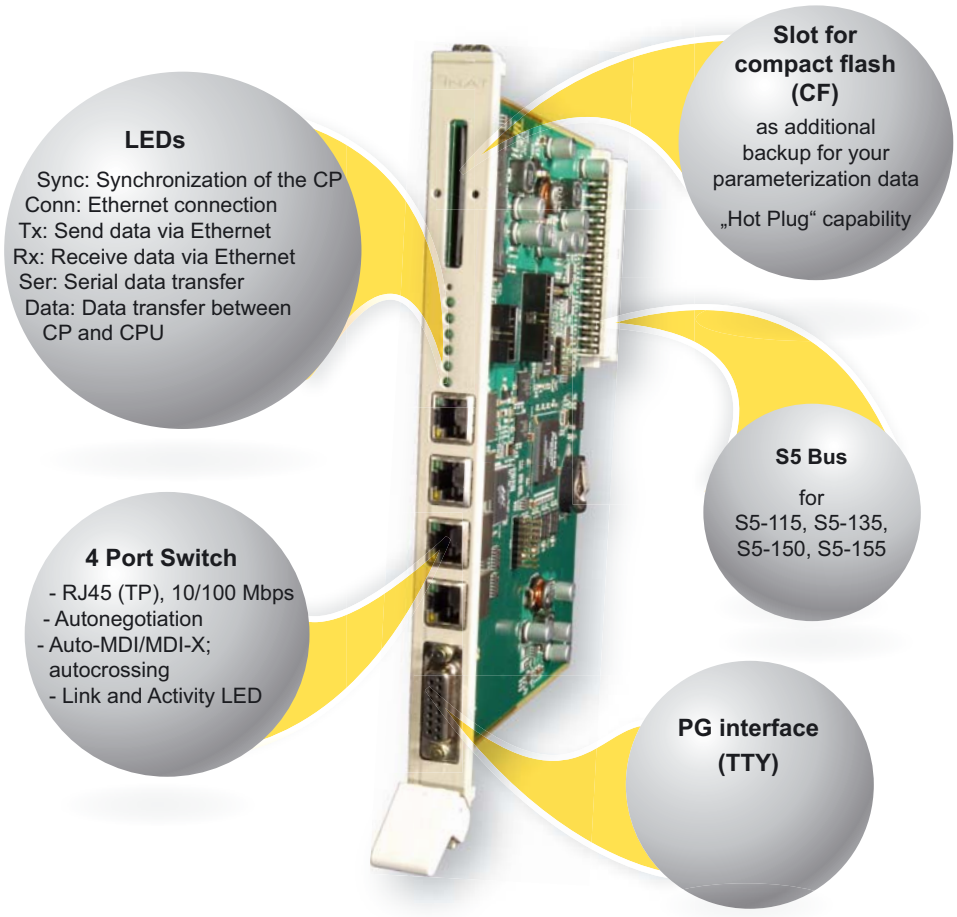
INAT S5-TCP/IP 100

Turbo-Ethernet for PLC Oldie Simatic® S5

with 10/100 Mbps NEW and 4 port Switch


LEDs
Sync: Synchronization of the CP
Conn: Ethernet connection
Tx: Send data via Ethernet
Rx: Receive data via Ethernet
Ser: Serial data transfer
Data: Data transfer between CP and CPU
Slot for compact flash (CF)
as additional backup for your parameterization data
„Hot Plug“ capability
S5 Bus
for S5-115, S5-135, S5-150, S5-155
4 Port Switch
- RJ45 (TP), 10/100 Mbps
- Autonegotiation
- Auto-MDI/MDI-X; autocrossing
- Link and Activity LED
PG interface (TTY)

The S5-TCP/IP 100 is an Ethernet interface for the Simatic® S5 of Siemens. With 10 Mbps und 100 Mbps, the communications processor offers maximum data transmission speeds. The Ethernet CP communicates with the S7 and S5 controllers of Siemens as well as with Modbus on TCP interfaces of Schneider, Wago, and others. Raw data (Send/Receive) can also be transmitted. Connect your S5 PLC with other controllers in the field, visualize operational and machine data on your PC with OPC, or program your S5 with TCP/IP or ISO (H1). You can connect additional field devices with the integrated 4 port switch and establish a small local network, for example.

Features:

► Security

- High degree of data transmission security due to continuous monitoring
- Optional password protection
- Backup of configuration when power fails
- Additional backup option on Compact Flash Card

► Easy-To-Use Diagnosis

- Single-connection diagnosis and overview of all connections
- PLC interface diagnosis
- Separate monitoring of standard connections and Fetch-on-Event connections
- Network status, number of sent and received frames, and evaluation of the indicator world

► Communication

- Processes TCP/IP, ISO on TCP (RFC1006) and H1 simultaneously
- Communication with Siemens S5- and S7 controllers via ISO on TCP (RFC1006)
- Communication with controllers of the Schneider Groupe, Beckhoff, Wago and others via Modbus on TCP
- Send/Receive communication (Raw data transmission)
- Pre-parameterized standard connections for communication on basis layer 7 (e.g., OPC)
- Event-controlled data communication via Fetch-on-Event

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Technical data:

4 Port Ethernet switch
- RJ45
- 10/100 Mbps
- Half-duplex / full-duplex
- 10 BaseT / 100 BaseTX
- Autonegotiation
- Link LED and Activity LED for each port

PG interface
- 1 x TTY
- 15-pole, sub D socket with slide-lock bolts

Compact Flash Slot
- Type I or II (standard)
- For configuration backup, „Hot Plug“ capacity

Can be used on following PLCs
- S5-115
- S5-135
- S5-150
- S5-155

Supported protocols
- TCP/IP
- ISO on TCP (RFC1006)
- ISO (H1)
- Modbus on TCP
- PLC header
- DNS, DHCP, SNMP services according to MIB II, FTP

Job Types
- Send Direct
- Receive Direct
- Fetch active
- Fetch passive
- Write active
- Write passive
- Fetch-on-Event

Space requirements
- 1 slot required
- For use in S5-115 adaption casing required

Card format
- Double Europe

Conditions
- Operating temperature: 0 to +60°C
- Transportation/storage temperature: -20 to +70°C
- Relative humidity: max. of 95%

Supply Voltage
- DC +5V via S5 backplane

Current consumption
- Max. 3 A

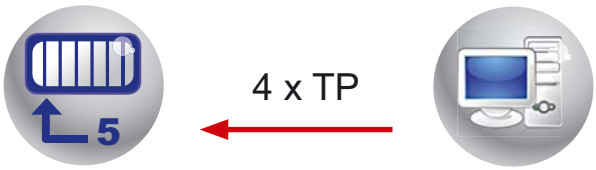
Configuration software
- INATnet parameterization

Compatibility
- S5-TCP/IP and S5-TCP/IP 100 are compatible so that existing configurati on files may be used.

How to parameterize the S5-TCP/IP 100:

1 Indirectly via an Ethernet bus path
- via TCP/IP or ISO (H1)

2 Directly from PC to one of the 4 TP interfaces
- via standard Ethernet cable



3 Directly from PC to PG interface
- via RS232 / TTY converter cable

Order data:

S5-TCP/IP 100 Ethernet interface for the Simatic® S5, including INATnet parameterization	Order number.: 200-4000-01
PLC cable for S5-CP / PLC for programming the S5 via Ethernet	Order number.: 700-1700-01
RS232 / TTY converter cable for serial parameterization	Order number.: 700-1500-05
CF Card, 128 MB	Order number.: 700-2400-02

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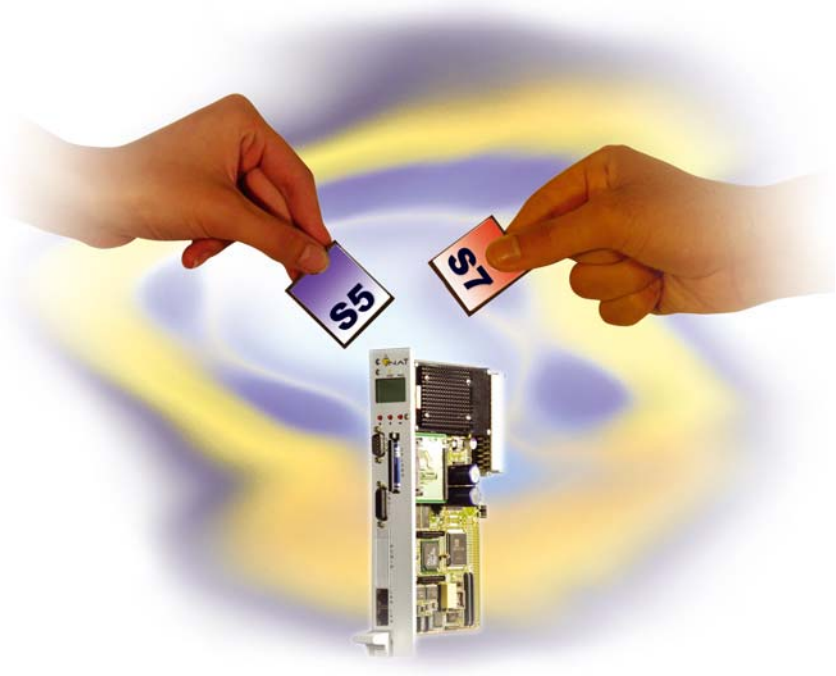
INAT-X5 / -X7

Upgrade in a flash



While Siemens is phasing out its S5 product line, your investment in S5 PLC technology is secure with replacement X5 / X7 CPUs from INAT.

The X5 is a powerful sophisticated processing unit, with an integrated Ethernet controller that can replace your old existing CPUs in the Siemens S5-115U and 135 / 155U PLCs.

When the time comes to standardize on a modern S7 PLC technology platform, you can upgrade your S5 PLC to an S7 PLC in a flash. Simply change the Flash Card in your X5 powered S5 PLC and your CPU becomes an X7 CPU with the power of 416 CPU from Siemens.

What is X5 / X7?

- X5 / X7 CPUs are sophisticated processing units that can be used in the Siemens S5-115U, 135/155U and S5-150U
- The software based X5 and X7 CPUs have the same hardware. They only differ in the PLC CPU software (S5 resp. S7)

Special features:

- Can be programmed with STEP 7 (X5 with either Siemens STEP 5 or STEP 7) providing maximum flexibility when developing projects strategies: Programming is possible via serial interface or Ethernet
- Integrated Ethernet controller: no Ethernet CP for TCP/IP required
- Mobile Pentium Processor 450 MHz
- Integrated Flash Socket for CF cards or IBM Microdrives
- Direct visualization of process data via integrated graphic module
- Direct information of CPU data (cycle time, load of the CPU etc.)
- Supports page frame access for IM and CP modules
- PC-MIP module slot for graphic, fieldbus etc.
- Diagnosis LCD display
- 64 MB memory on board (2 MB retained)
- Supported serial protocols: 3964R, RK512, ASCII
- Supported Ethernet protocols: TCP/IP, ISO on TCP (RFC 1006)

Easy to change

X5
compatible to
CPU 945
(941, 942, 943, 944)
CPU 948
(946/947, 928)

X7
compatible to
CPU 416

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INAT
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Technical data:

- **Procesor**
  K6-2E+ Procesor 450 MHz
- **Power Supply**
  +5 V DC: 4,85V...5,24V
- **RAM Extension**
  64 MB SDRAM
  128 KB Bios Flash
  2 MB retained SRAM
- **Serial Interfaces**
  1 x AS511(TTY) or RS232 with 15-pin Sub-D female
  1 x RS232 mit 9 pin. Sub-D male
- **Ethernet Interfaces**
  2 x 10/100 MBit/s, RJ45, 2 port Switch
- **Interfaces optional**
  Keyboard and Mouse via PS2
  Via PC-MIP
  4 x RS232
  4 x RS232 / 485
  Graphic 1.280 x 1.024
- **Serial protocols**
  3964(R), RK512, ASCII, STX/ETX
- **Transport Protocols**
  TCP/IP, ISO on TCP (RFC1006)
- **Busadaption**
  SIMATIC S5 115U, 135U/155U and 150U.
  Support of P and Q the periphery incl.
  Supports page frame access
  for MI and CP modules
- **Software**
  Opetrating system RTOS-32
  Software RS7 SPS CPU software or
  RS5 SPS CPU software
- **Dimensions**
  Double Europe card
  Height: 6 HE; Width: 8 TE
- **Operating conditions**
  Operating temperature: -20°C up to +50°C
  Storage temperature: -40°C up to +85°C
  Relative humidity: Maximum of 95 %

Order data:

X modular CPU for the S5

- **includes RS PLC CPU software**
- **includes serial parameterization cable**

X5 / X7 CPU for AG 115U	Order No.: 700-4300-01
X5 / X7 CPU for AG 135/155U	Order No.: 700-4310-01
X5 / X7 CPU for AG 150U	Order No.: 700-4320-01
RS 5 software (CPU 945 compatible)	Order No.: 700-4330-01
RS 5 software (CPU 948 compatible)	Order No.: 700-4331-01
RS 7 software (CPU 416/945 compatible) (mixed operation)	Order No.: 700-4340-01
RS 7 Software (CPU 416/948 compatible) (mixed operation)	Order No.: 700-4341-01

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Gateway Ethernet to MPI/PPI

Visualization and Programming via Ethernet

Inexpensive Alternative to a CP

Features:

- Ethernet interface via MPI / PPI port of the Simatic S7 (S7-400, S7-300 and S7-200)
- Programming of the S7 without Softnet
- Remote maintenance of the S7 via LAN and WAN
- OPC communication with Ethernet OPC Server
- Access to data blocks, flags, periphery, counter, timer
- Ethernet to MPI/PPI Gateway
- Programming via Step 7 and S7 for Windows
- Easy to install between a Ethernet port (switch) and the S7
- Standard Profibus plug
- Configuration via Ethernet diagnosis channel
- Data connection via FDL telegrams

Your advantage: 6 connections

Technical Data:

- Ethernet Interface
  - RJ45, 10/100 Mbps
- Serial Interface
  - MPI/PPI, Profibus, 12 MBaud
- PLCs:
  - S7-400
  - S7-300
  - S7-200
- Connections:
  - 6 simultaneous PC connections
- Power Supply:
  - 24 V DC, external, 100 mA
- Dimensions (in mm):
  - L = 25, D = 65, H = 100
- Cable Length:
  - 2 meters

Order data:

IBH Link S7 Plus	Order No.: 500-4000-02

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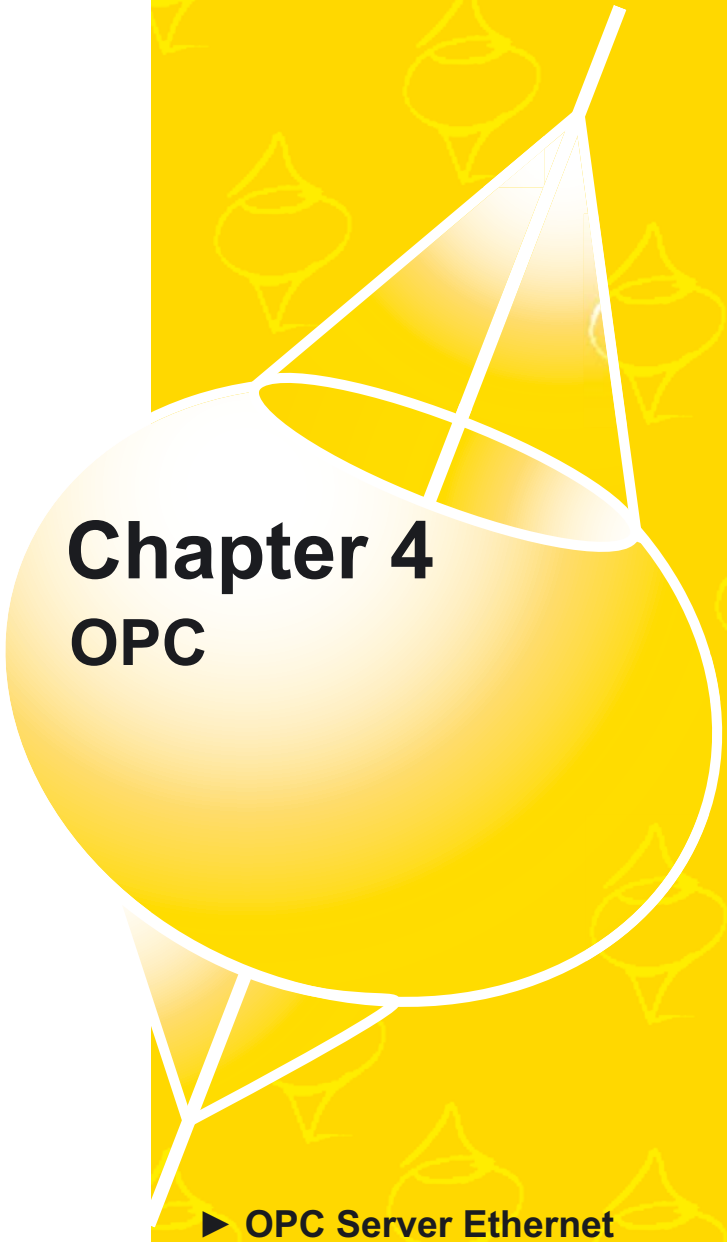


Chapter 4
OPC

- OPC Server Ethernet
- OPC Server MPI/PPI
- OPCpipe
- Open Source OPCpipe

OPC Server

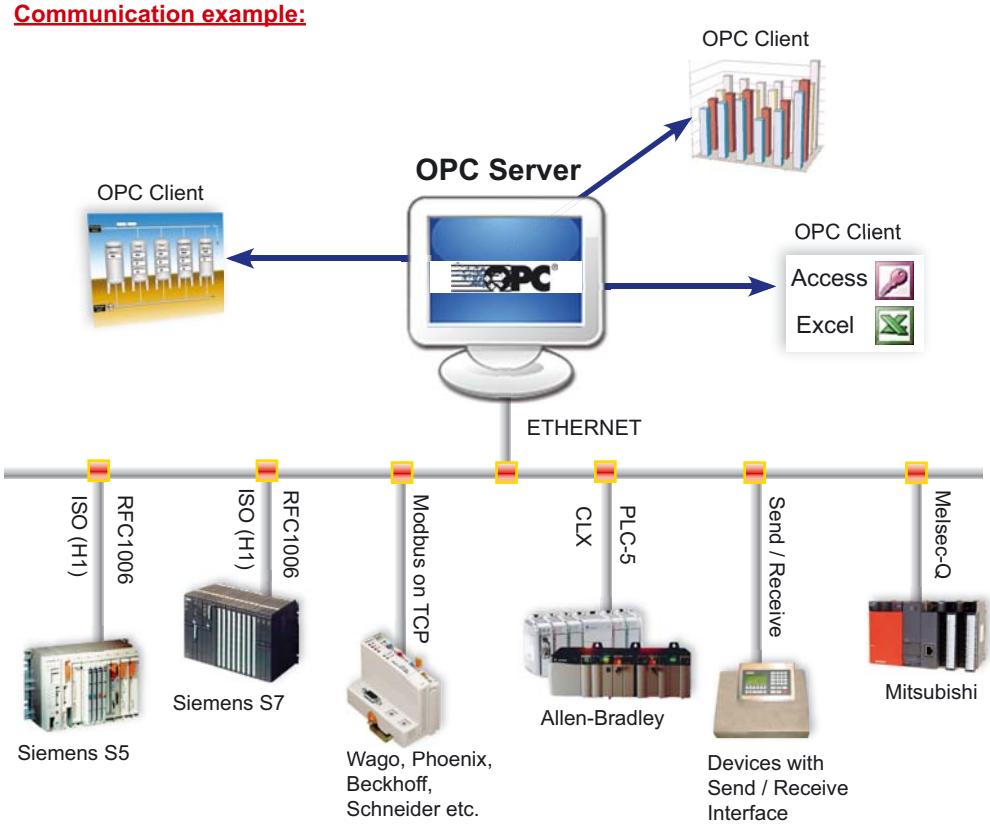
OPC Server (Ethernet + Serial) for the most important **industrial protocols**

OPC Server

INAT OPC Servers are available for all important controller systems: Siemens, Rockwell Automation, Schneider Electric etc.

The Servers are easy to configure, extremely fast and posess comprehensive diagnosis functions.

Communication example:



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OPC Server Ethernet

The OPC Server Ethernet family represents a number of OPC Servers, each with a different range of supported protocols. Which OPC Server Ethernet you use, depends on which PLCs and devices you want to access with the OPC Server. We provide servers that are exactly designed for your needs: beginning with a Modbus OPC Server, continuing with an H1 OPC Server up to an All-in-One OPC Server, that supports all important industrial protocols.
If there is an expansion required later – no problem – protocols can be added to the Servers.

Characteristics:

- High Performance Protocol for optimized data transfer
- No limitation of number of connections, no limitation of number of tags
- Send/Receive for communication via socket interface (raw data)
- High reliability
- Requires less system ressources
- Universal Data Access Server for all OPC Clients with OPC interface 1.x and 2.05
- Runs as service or as application
- Easy implementation with symbolic addressing (Alias Browsing)
- Static and dynamic tags
- Optional: OPCpipe functionality for network-wide OPC communication **WITHOUT** DCOM
- Comprehensive diagnosis tools
- Download the 72h version with full functional range for your test purposes
- Licensing with software key or dongle
- Standards: OPC DA 1.x, OPC DA 2.0, DDE, FastDDE, AdvancedDDE, CF Text

Please note that in conjunction with RAID systems and cluster stations, dongle licensing is required

All OPC Servers Ethernet at a glance:

Supported transport and application protocols

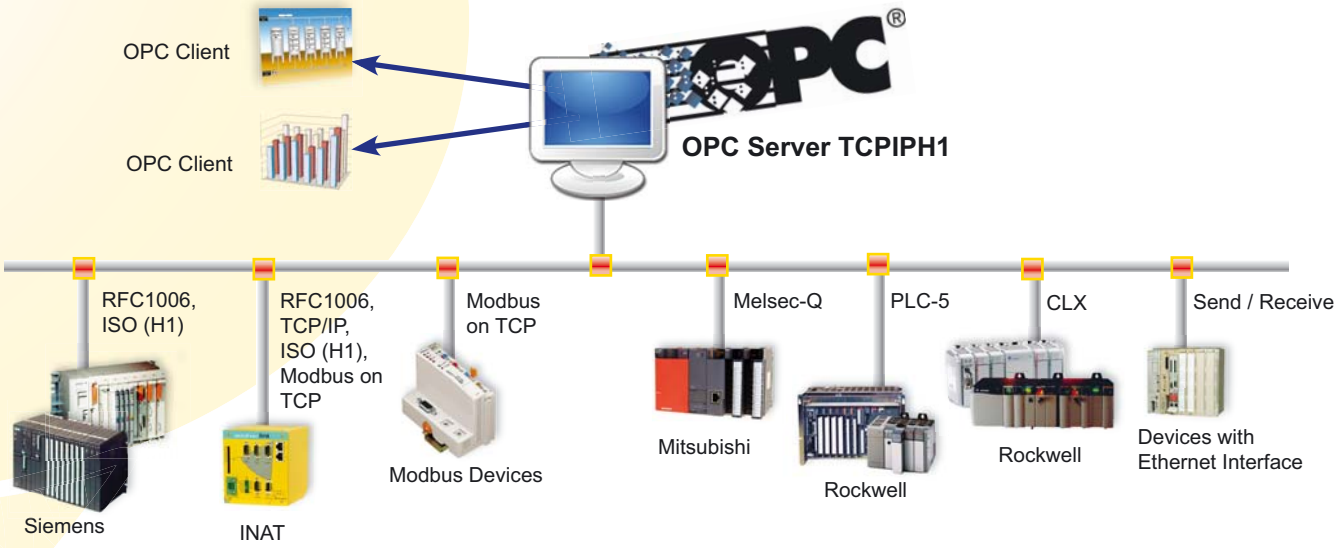
SUPPORTED PROTOCOLS:	INAT OPC SERVER ETHERNET					
	TCPIPH1	TCPIP-S	TCPIP-I	Modbus on TCP	H1	Mitsubishi
TCP/IP	✔	✔	✔	✔	–	✔
ISO on TCP (RFC1006)	✔	✔	–	–	–	–
TCP/IP with PLC Header	✔	✔	✔	✔	–	✔
ISO (H1)	✔	–	–	–	✔	–
S7 Protocol	✔	✔	✔	–	✔	–
S5-AP	✔	✔	✔	–	✔	–
AB PLC-5	✔	✔	–	–	–	–
AB CLX	✔	✔	–	–	–	–
Melsec-Q	✔	✔	–	–	–	✔
Modbus on TCP	✔	✔	✔	✔	–	–
Send / Receive	✔	✔	✔	✔	✔	✔
netLINK / netLINK Plus	✔	✔	✔	✔	–	–

OPC Server TCPIPH1

The All-in-One OPC Server is designed for heterogeneous networks, where PLCs and devices of different manufacturers are used. Besides the Standard TCP/IP protocol, that is used in most Industrial Ethernet networks, the Server supports the Sinec H1 protocol. With it older Siemens systems may be integrated as well. The Server can be used for miscellaneous Ethernet interfaces such as INAT, Siemens, Rockwell Automation, Mitsubishi, Wago, Schneider Electric, Beckhoff etc.

- For INAT and Siemens CPs
- For Allen-Bradley CLX PLCs (CompactLogix, ControlLogix)
- For Allen-Bradley PLC-5 PLCs
- For diverse Modbus on TCP interfaces (Schneider, Wago, Beckhoff....)
- For Mitsubishi Melsec-Q PLCs
- Works with IBH Link, netLINK, NETLink Pro and others
- Easy import of Step® 7 symbolic names directly from the Step® 7 project
- Automatic CLX symbol import, as soon as connection between OPC Server and CLX is established
- Routing via S7 subnets: Access S7 PLCs in Profibus subnets or MPI subnets
- Including ISO on TCP (RFC1006) and INAT H1 driver

TRANSPORT PROTOCOLS:	APPLICATION PROTOCOLS:
TCP/IP, ISO on TCP (RFC1006), TCP/IP with PLC Header, ISO (H1)	S7 Protocol, S5-AP, Modbus on TCP, CLX, PLC-5, Melsec-Q, Send / Receive, netLINK / netLINK Plus, NETLink Pro
FOR:	
INAT:	S5-TCP/IP-100, echolink (e.g. with S5-95U)
Siemens:	Simatic PLCs with TCP/IP or H1 interface
Rockwell Automation:	Allen-Bradley PLC-5, SLC 500, CompactLogix, ControlLogix
Mitsubishi:	Melsec-Q PLCs
Other:	Devices with Modbus on TCP interface, Devices with Send / Receive interface
Operating systems:	**Windows NT / 2000 / XP / 2003 / Vista / 2008**



Order data:

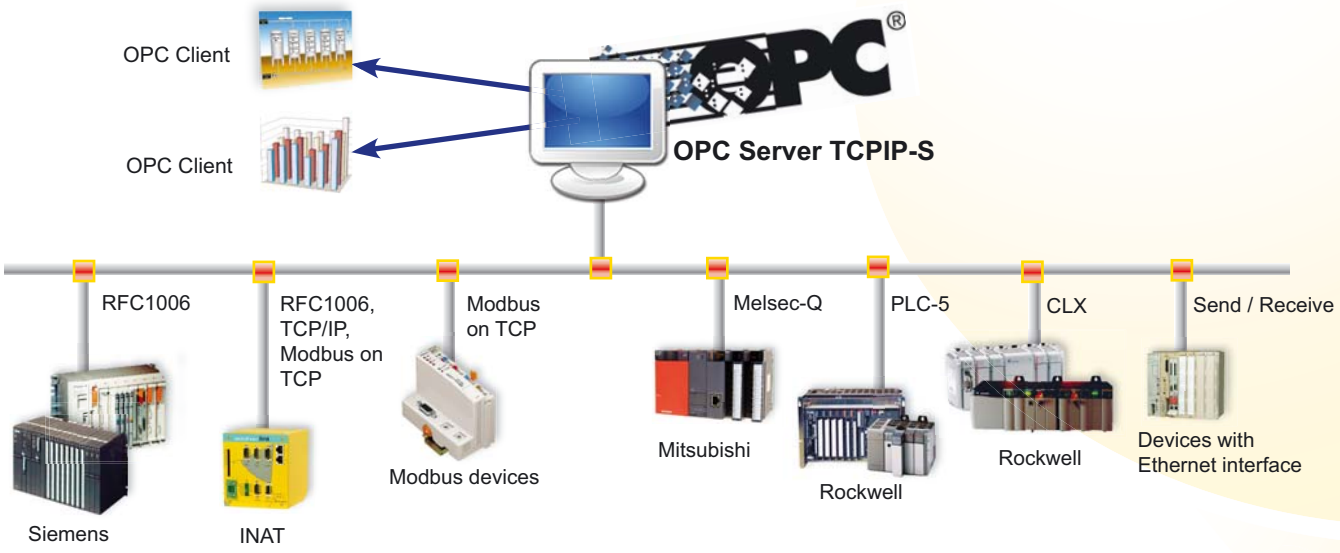
Single user license	Order number: 100-3100-01
Single user license incl. USB dongle	Order number: 100-3100-20
Upgrade	Order number: 100-3100-Upg
Upgrade incl. USB dongle	Order number: 100-3100-Dgl

OPC Server TCPIP-S

The OPC Server TCPIP-S used in heterogeneous TCP/IP networks, where PLCs and devices of different manufacturers are used. The Server may be used for diverse Ethernet interfaces from INAT, Siemens, Rockwell Automation, Mitsubishi, Wago, Schneider Electric, Beckhoff etc.

- For INAT and Siemens CPs
- For Allen-Bradley CLX PLCs (CompactLogix, ControlLogix)
- For Allen-Bradley PLC-5 PLCs
- For diverse Modbus on TCP interfaces (Schneider, Wago, Beckhoff ...)
- For Mitsubishi Melsec-Q PLCs
- Works with IBH Link, netLINK, NETLink Pro and others
- Easy import of Step® 7 symbolic names directly from the Step® 7 project
- Automatic CLX symbol import, as soon as connection between OPC Server and CLX is established
- Routing via S7 subnets: Access S7 PLCs in Profibus subnets or MPI subnets
- Including ISO on TCP (RFC1006)

TRANSPORT PROTOCOLS:	APPLICATION PROTOCOLS:
TCP/IP, ISO on TCP (RFC1006), TCP/IP with PLCs Header	S7 Protocol, S5-AP, Modbus on TCP, CLX, PLC-5, Melsec-Q, Send / Receive, netLINK / netLINK Plus, NETLink Pro
FOR:	
INAT:	S5-TCP/IP-100, echolink (e.g. with S5-95U)
Siemens:	Simatic PLCs with Ethernet interfaces for TCP/IP and/or RFC1006
Rockwell Automation:	Allen-Bradley PLC-5, SLC 500, CompactLogix, ControlLogix
Mitsubishi:	Melsec-Q PLCs
Other:	Devices with Modbus on TCP interface, Devices with Send / Receive interface
Operating systems:	**Windows NT / 2000 / XP / 2003 / Vista / 2008**



Order data:

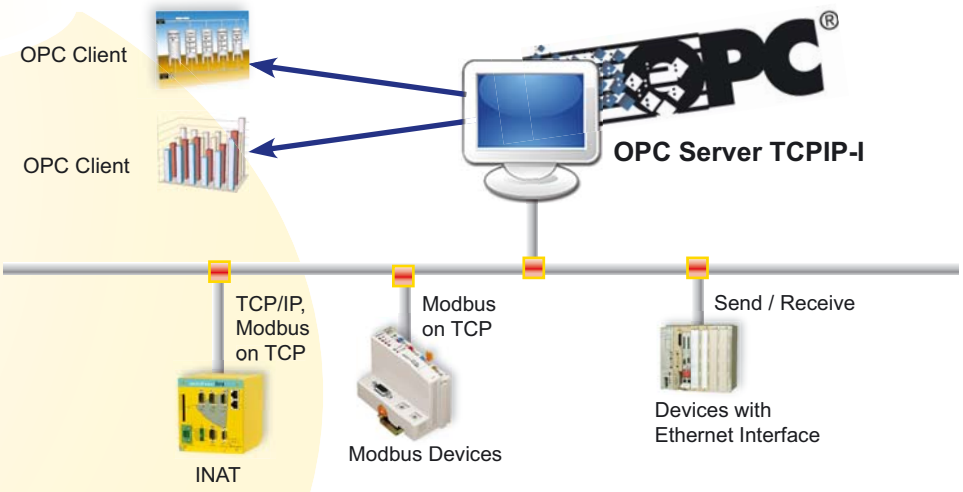
Single user license	Order number: 100-3120-01
Single user license incl. USB dongle	Order number: 100-3120-20
Upgrade	Order number: 100-3120-Upg
Upgrade incl. USB dongle	Order number: 100-3120-Dgl

OPC Server TCPIP-I

The OPC Server TCPIP-I is designed for OPC communication with INAT components and Modbus devices. It may be used also to access S7 PLCs that use an Ethernet-MPI/PPI gateway (e.g. netLINK) instead of a communication processor (CP)

- ► For INAT CPs
- ► For various Modbus on TCP interfaces (Schneider, Wago, Beckhoff ...)
- ► Works with IBH Link, netLINK, NETLink Pro and others
- ► Easy import of Step® 7 symbolic names directly from the Step® 7 project

TRANSPORT PROTOCOLS:	APPLICATION PROTOCOLS:
TCP/IP, TCP/IP with PLC Header	S7 Protocol, S5-AP, Modbus on TCP, Send / Receive, netLINK / netLINK Plus, NETLink Pro
FOR:	
INAT:	S5-TCP/IP-100, echolink (e.g. with S5-95U)
Other:	Devices with Modbus on TCP interface, Devices with Send / Receive interface
Operating system:	**Windows NT / 2000 / XP / 2003 / Vista / 2008**



Order data:

Single user license	Order number: 100-3150-01
Single user license incl. USB dongle	Order number: 100-3150-20
Upgrade	Order number: 100-3150-Upg
Upgrade incl. USB dongle	Order number: 100-3150-Dgl

Test first, then license!

At **www.inat.de** a 72h version of all OPC Servers is available

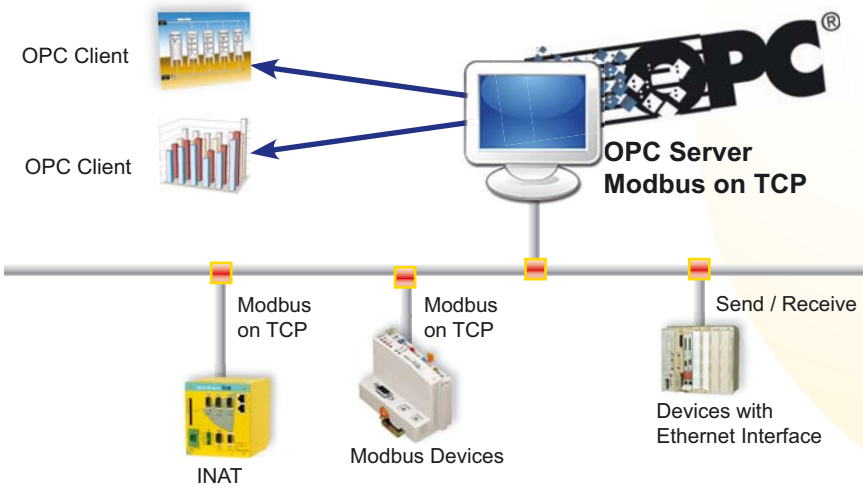
INAT
Industrial Networks for Automation Technology

OPC Server Modbus on TCP

The OPC Server Modbus on TCP may be used for all devices and PLCs that support the Modbus on TCP protocol. These are PLCs from Schneider Electric as well as interface connections from different manufacturers e.g. Beckhoff, Wago, Phoenix etc. It can be used also to access S7 PLCs, that use an Ethernet-MPI/PPI gateway (e.g. netLINK) instead of a communication processor (CP).

- For various Modbus on TCP interface connections
- For INAT CPs (**ONLY** Modbus- and Send / Receive communication)
- Works with IBH Link and netLINK
- Easy import of Step® 7 symbolic names directly from the Step® 7 project

TRANSPORT PROTOCOLS:	**APPLICATION PROTOCOLS:**
TCP/IP, TCP/IP with PLC Header	Modbus on TCP, Send / Receive, netLINK / netLINK Plus
FOR:	
INAT:	S5-TCP/IP-100, echolink (e.g. with S5-95U)
Modbus on TCP interfaces:	All interfaces, that support the following Modbus on TCP function codes : *01 Read coil* *02 Read discrete input* *03 Read holding register* *04 Read input register* *05 Write single coil* *06 Write single register* *15 Write multiple coils* *16 Write multiple registers*
Other:	Devices with Send / Receive interface
Operating systems:	**Windows NT / 2000 / XP / 2003 / Vista / 2008**



Test first, then license!

At **www.inat.de** a 72h version of all OPC Servers is available

Order data:

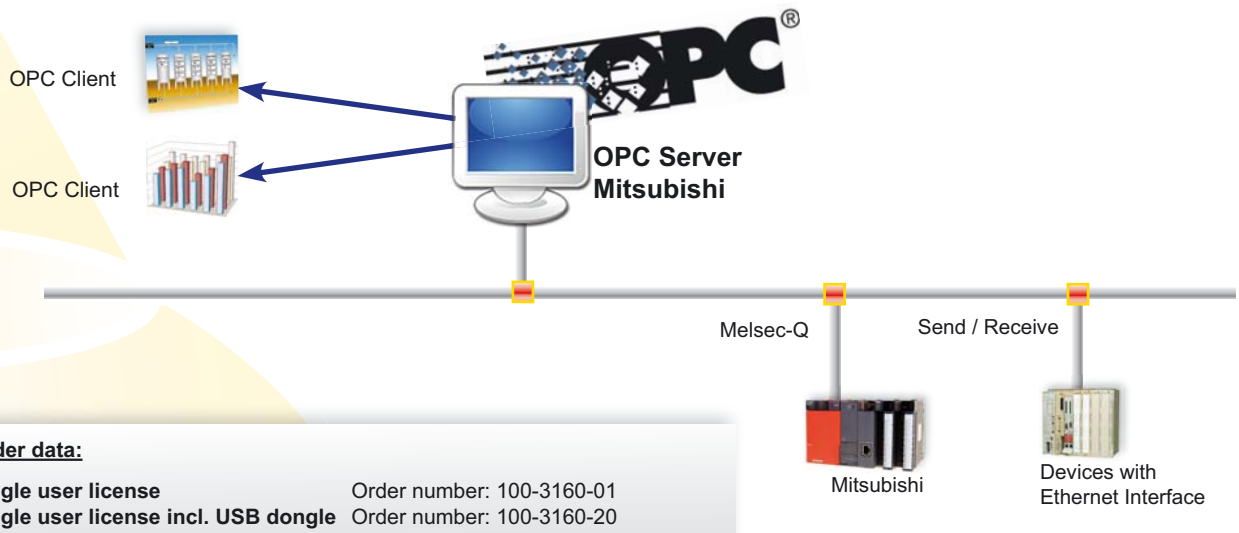
Single user license	Order number: 100-3140-01
Single user license incl. USB dongle	Order number: 100-3140-20
Upgrade	Order number: 100-3140-Upg
Upgrade incl. USB dongle	Order number: 100-3140-Dgl

OPC Server Mitsubishi

The OPC Server Mitsubishi is used for communication with Mitsubishi's Melsec-Q PLCs.
It handles Send/Receive also, so that transfer of raw data is possible, too.

- For Mitsubishi Melsec-Q PLCs

TRANSPORT PROTOCOLS:	APPLICATION PROTOCOLS:
TCP/IP, TCP/IP with PLC Header	Melsec-Q, Send / Receive
FOR:	
Mitsubishi:	Melsec-Q PLCs
Others:	Devices with Send / Receive interface
Operating systems:	**Windows NT / 2000 / XP / 2003 / Vista / 2008**



Order data:

Single user license	Order number: 100-3160-01
Single user license incl. USB dongle	Order number: 100-3160-20
Upgrade	Order number: 100-3160-Upg
Upgrade incl. USB dongle	Order number: 100-3160-Dgl

OPC Server H1

The OPC Server H1 is used for communication with S5 and S7 PLCs, that support the Sinec H1 Protocol

- For INAT and Siemens CPs
- Easy import of Step® 7 symbolic names into server directly from the Step® 7 project
- Includes INAT H1 driver

TRANSPORT PROTOCOLS:	APPLICATION PROTOCOLS:
ISO (H1)	S7 Protocol, S5-AP, Send / Receive
FOR:	
INAT:	S5-TCP/IP-100, echolink (e.g. with S5-95U)
Siemens:	Simatic PLCs with Ethernet interface for ISO (H1)
Other:	Devices with Modbus on TCP interface, Devices with Send / Receive interface
Operating systems:	**Windows NT / 2000 / XP / 2003 / Vista / 2008**

Order data:

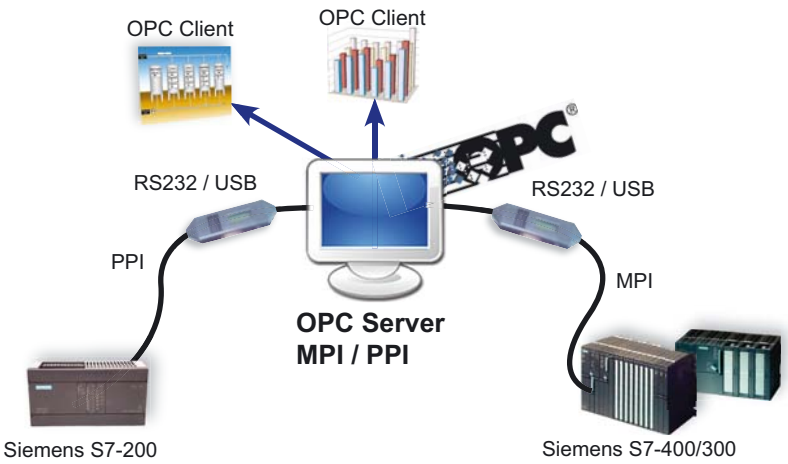
Single user license	Order number: 100-3110-01
Single user license incl. USB dongle	Order number: 100-3110-20
Upgrade	Order number: 100-3110-Upg
Upgrade incl. USB dongle	Order number: 100-3110-Dgl

OPC Server MPI/PPI

The INAT OPC Server MPI/PPI enables OPC communication via MPI/PPI to Siemens S7 CPUs.
For that the USB interface or the RS232 interface of the PC are being used.

Characteristics:

- Provides MPI bus
- Hardware modifications of the PC and the PLC are unnecessary
- No limitation of number of connections, no limitation of number of tags
- For serial access to Siemens S7-400/300 and S7-200 PLCs
- Universal Data Access Server for all OPC Clients with OPC interface 1.x and 2.05
- Runs as service or as application
- Easy import of Step® 7 symbolic names directly from the Step® 7 project
- Easy start-up through symbolic adressing (Alias Browsing)
- Static and dynamic tags
- Download the 72h version with full functional range for your test purposes
- Standards: OPC DA 1.x, OPC DA 2.0, DDE, FastDDE, AdvancedDDE, CF-Text
- Protocols: MPI to S7-400/300, PPI to S7-200



Order data:

Single user license	Order number: 100-3300-01
Single user license incl. USB dongle	Order number: 100-3300-20
Upgrade	Order number: 100-3300-Upg
Upgrade incl. USB dongle	Order number: 100-3300-Dgl

Accessory MPI / PPI adapter

- RS232 and/or USB – MPI / PPI adapter
- Length: 3 meters

RS232 – MPI / PPI adapter, 187,5 KBaud
with integrated LCD display; RS232, 9pin D-sub female, up to 115,2 KBaud – MPI / PPI, 9 pole D-sub male, up to 187,5 KBaud

RS232 + USB – MPI / PPI adapter cable, 12 MBaud
with integrated LCD display and membrane keys; RS232, 9pin D-sub female, up to 115,2 KBaud – MPI / PPI, 9pin D-sub female, up to 12 MBaud **or**: USB, USB-A-connector, USB 1.0 – MPI / PPI, 9pin D-sub male, up to 12 MBaud

USB – MPI / PPI adapter cable, 12 MBaud
with integrated LCD display and membrane keys; USB, USB-A-connector, USB 1.0 – MPI / PPI, 9pin D-sub male, up to 12 MBaud

Order data:

RS232 – MPI / PPI adapter, 187,5 KBaud	Order number: 400-9359-MPI
RS232 + USB – MPI / PPI adapter, 12 MBaud	Order number: 400-9352-MPI
USB – MPI / PPI adapter, 12 MBaud	Order number: 400-9352-USB

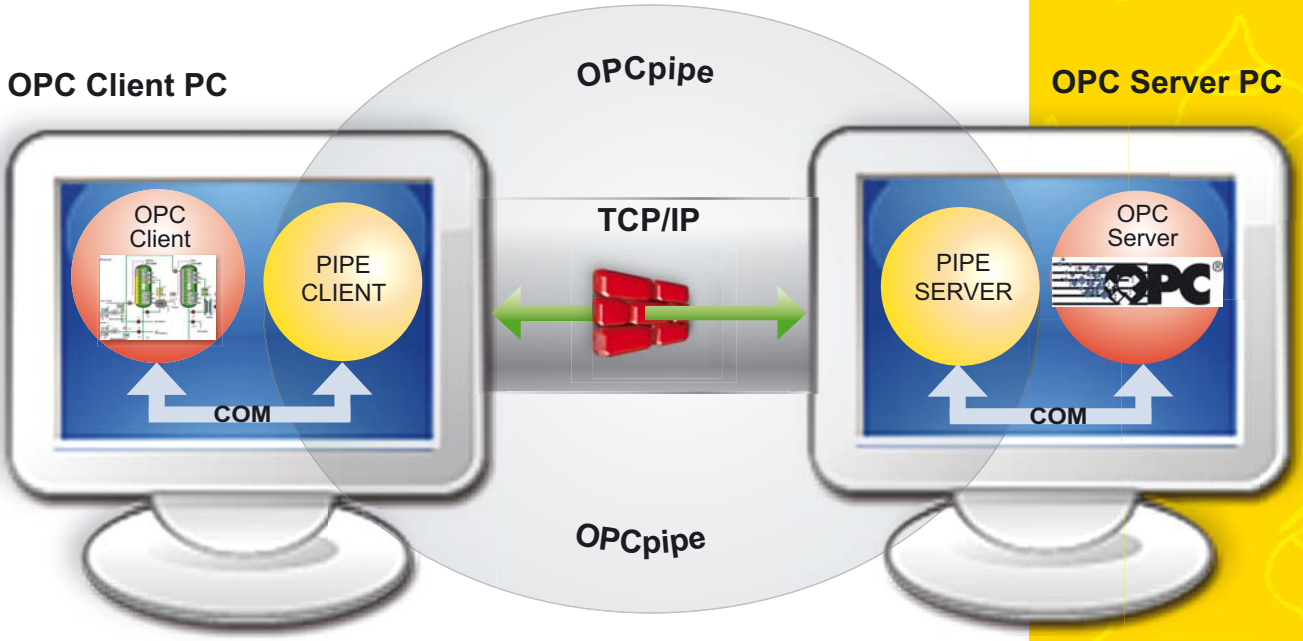
Step® und Simatic® sind eingetragene Warenzeichen der Siemens AG.

Stand: 02.2009

OPCpipe®

Network spanning OPC communication **without DCOM**:
Transparent and reliable

never again DCOM effects



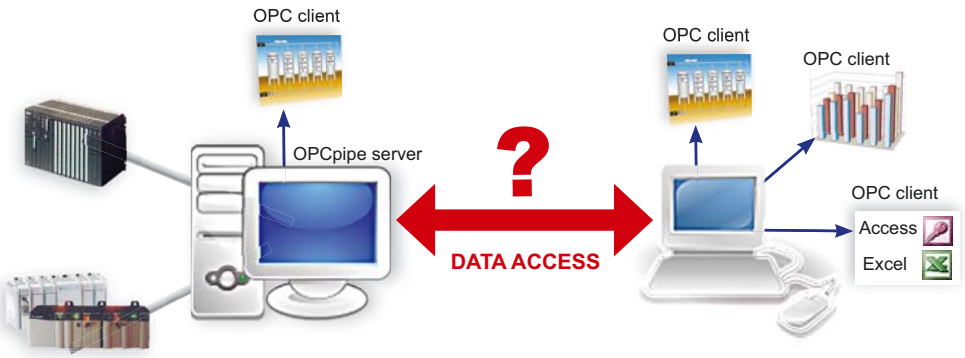
DCOM's Security settings are the number 1 problem in network spanning OPC communication. Configuration is anything but simple and often very time-consuming.

OPCpipe puts an end to this problem since it enables network spanning OPC communication **WITHOUT** DCOM.

Via TCP/IP OPCpipe tunnels the data exchanged between client and server. The OPC communication is converted into a "normal" TCP/IP communication, transmitted via the network, and then converted back into an OPC communication on the target computer.

This enables communication across firewall boundaries or domains - completely without DCOM.

Problem: data access



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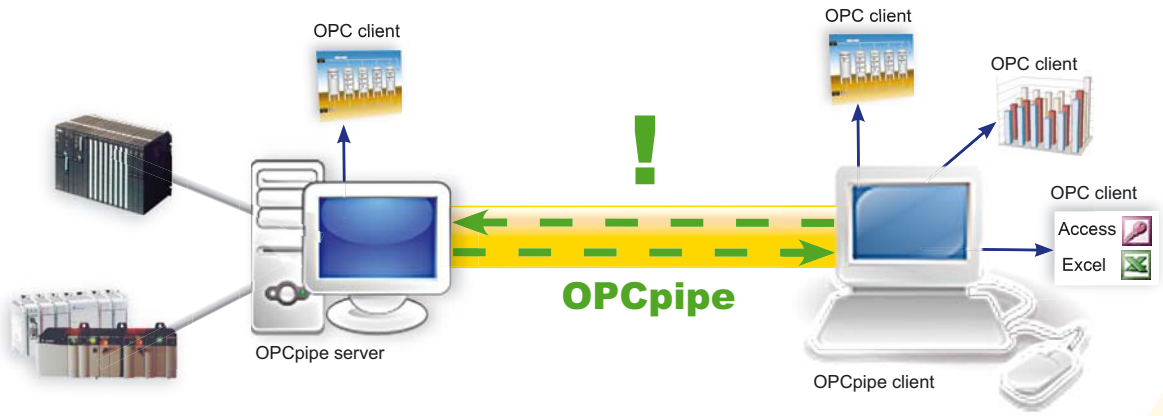
INAT Industrial Networks for Automation Technology

Solution: OPCpipe



Your advantages:

- ►INAT OPC servers contain OPCpipe function
- ►Easy configuration in 3 steps
- ►Complete browsing → no programming effort
- ►Extensive diagnostic tools
- ►Simultaneous communication with several OPC clients
- ►High-performance communication
- ►Reliable and increased security
- ►Communication across firewall boundaries
- ►Easy remote access via internet
- ►72 hour demo version with full scope of functions

Mode of operation:

OPCpipe is a protocol that „tunnels“ data that is being exchanged between client and server during OPC communication. For that the OPCpipe consists of two parts:

- ►OPCpipe server: replaces the INAT OPC Server
- ►OPCpipe client: Is run on the same PC as the OPC client

The OPCpipe accepts the request of the OPC-client and converts OPC communication into a „normal“ TCP/IP-communication.

Tunneled in that way data is being transmitted via a standard TCP/IP connection through the network to the target PC. When it arrives there the OPCpipe server accepts the data, „decodes“ it back to the OPC communication und hands it over to the OPC server.

The server handles the request and sends data back to the OPC client. The tunnel mechanism works similar in both directions.

Special features:

Simple configuration

- No programming necessary
- Pipe functionality already integrated on INAT OPCpipe servers
- Configuration in only 3 steps:
    1. Pipe connection on OPC server side: Define port number and access rights
    2. Pipe connection on OPC client side: Define IP address and port number
    3. Connect client and server and start communication

Full browsing capability without restrictions

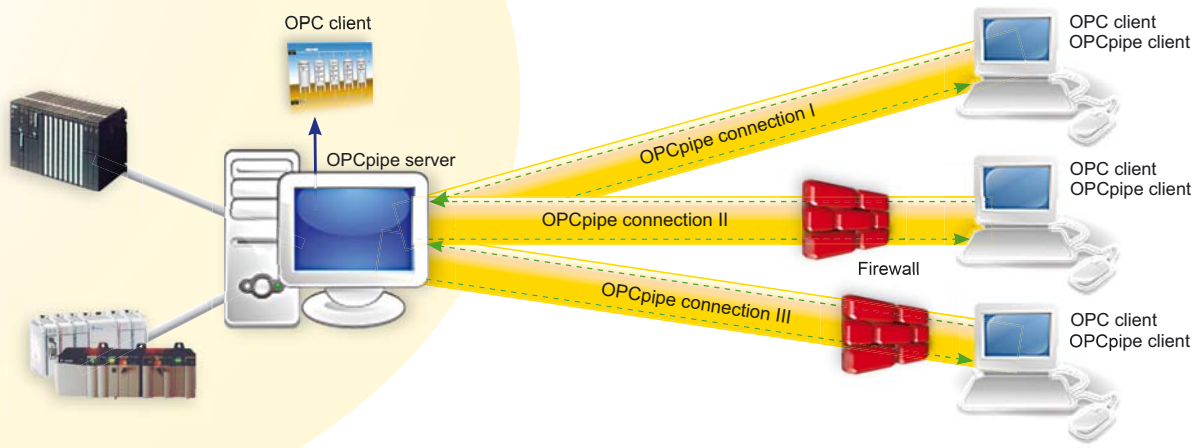
- All clients which support browsing can execute a remote browse command on the remote OPC server which means that all alias names (symbolic items) can be used immediately.
- Just as if the OPC server was present on the local computer

Extensive diagnostic tools

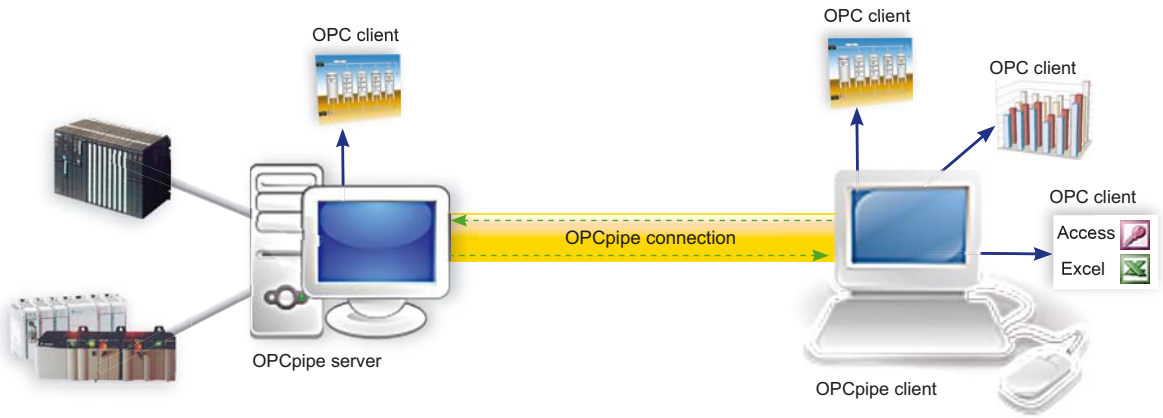
- Full diagnosis of all topics and items
- Information on connection parameters and communication states (e.g. status indication, sum of active items, number of transmitted/received frames and items, indication of which area is being accessed, and so on

Simultaneous communication with several OPC clients

Communication example 1:



Communication example 2:



Reliability and security

- In case of a communication interruption OPCpipe reestablishes the connection; all elements are being reregistered
- Communication via one single port
- Can be set for each individual OPC server connection (access path): whether access via OPCpipe is possible and whether write access via OPCpipe is permitted → in that case „disabled“ connections are invisible and unaccessible only for the OPC client

Supported OPC specifications

- OPC DA (Data Access) 1.0 / 2.0 / 2.05
- Logic of OPC DA 3.0 (structured data)

Order Data:

OPCpipe functionality is available for the following INAT OPC servers:

OPC-Server TCPIPH1	Order no.: 100-3100-01
OPCpipe-Server TCPIPH1	Order no.: 100-3101-01
OPC-Server TCPIP-S	Order no.: 100-3120-01
OPCpipe-Server TCPIP-S	Order no.: 100-3121-01
OPC-Server TCPIP-Modbus	Order no.: 100-3140-01
OPCpipe-Server TCPIP-Modbus	Order no.: 100-3141-01
OPC-Server TCPIP-I	Order no.: 100-3150-01
OPCpipe-Server TCPIP-I	Order no.: 100-3151-01
OPC-Server TCPIP-M (Mitsubishi)	Order no.: 100-3160-01
OPCpipe-Server TCPIP-M (Mitsubishi)	Order no.: 100-3161-01

OPCpipe client is available under the following Order no.:

OPCpipe-Client	Order no.: 100-1700-01
OPCpipe-Client, including Dongle	Order no.: 100-1700-20

OPCpipe® is a registered trademark of the INAT GmbH.

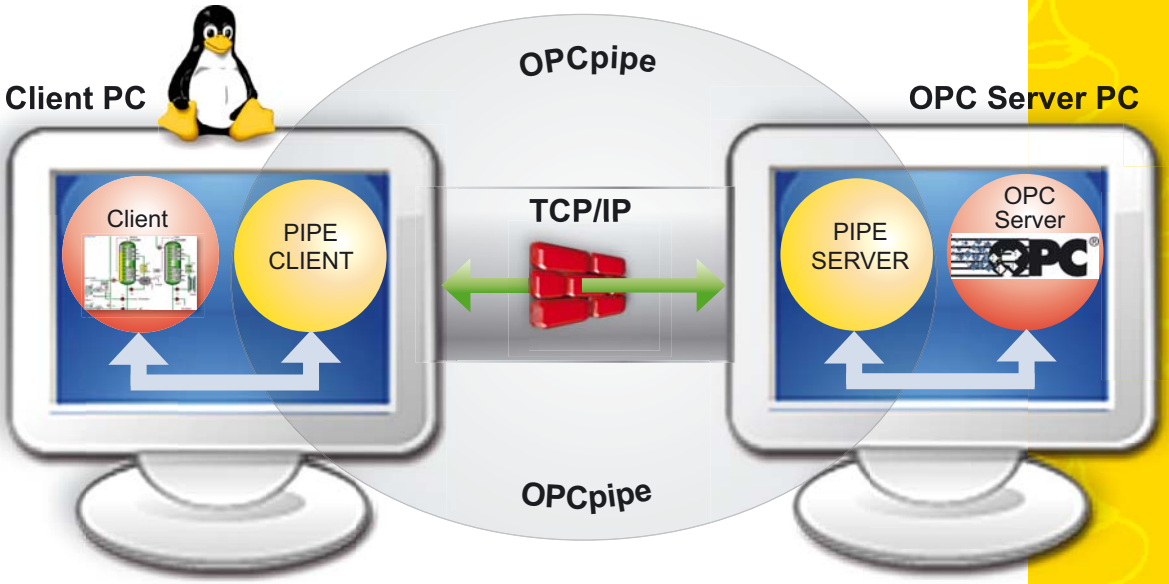
Stand: 02.2009

Open Source OPCpipe®

Network-overlapping OPC communication **for Windows and non Windows systems**

Automation technology is no longer imaginable without OPC communication, since this technology enables simple data exchange between automation hardware on the one side and applications on the other – via one standardized interface.
However, OPC has one critical disadvantage: It is currently based on DCOM – a technology defined by Microsoft. This means that it is not interoperable (i.e., is only available to Windows users). Applications written for non Windows computers cannot use the OPC server to access process data at the automation level (e.g., controllers).
Furthermore, the DCOM configuration is anything but simple and can turn out to be very complicated. Timeouts cannot be configured with DCOM and communication across Firewalls is also impossible.
DCOM is frequently disabled for security reasons and OPC clients on Windows computers then have no other way of accessing the OPC servers in the network.

+++ All these problems are solved with OPCpipe! +++



Functionality of the OPCpipe

OPCpipe images the functions of the OPC interface, thus opening OPC with all its advantages to a world which was unable to utilize this technology until now. Applications which run on non Windows systems (Linux, Solaris, etc.) can then use a normal TCP/IP connection to access OPCpipe servers which in turn establish the link to the automation components. Each pipe connection requires only one port which means that the connections can also be easily used across routers or firewalls. This creates a wide variety of possibilities: Implement the OPCpipe in your client applications such as visualizations, databases, ERP, etc. and make direct communication possible with OPCpipe servers across networks without DCOM and across Firewall boundaries. Integrate the OPCpipe functionality in your devices which are based on non Windows operating systems (e.g., PLCs, measuring devices, data loggers, etc.) and enable direct access to the existing system network. Communication with OPCpipe servers is then possible via Ethernet (e.g., for transmitting recipes or receiving process values).

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INAT
Industrial Networks for Automation Technology

Special features:

Protocol

- OPCpipe protocol completely layed open

Implementation

- Sample implementations for Windows and Linux freely available
- All programs use only the POSIX API
- The software is published under the LGPL (Lesser General Public License)

Bypass the complex DCOM security settings

Communication between OPC servers and non Windows applications

Communication across firewall boundaries

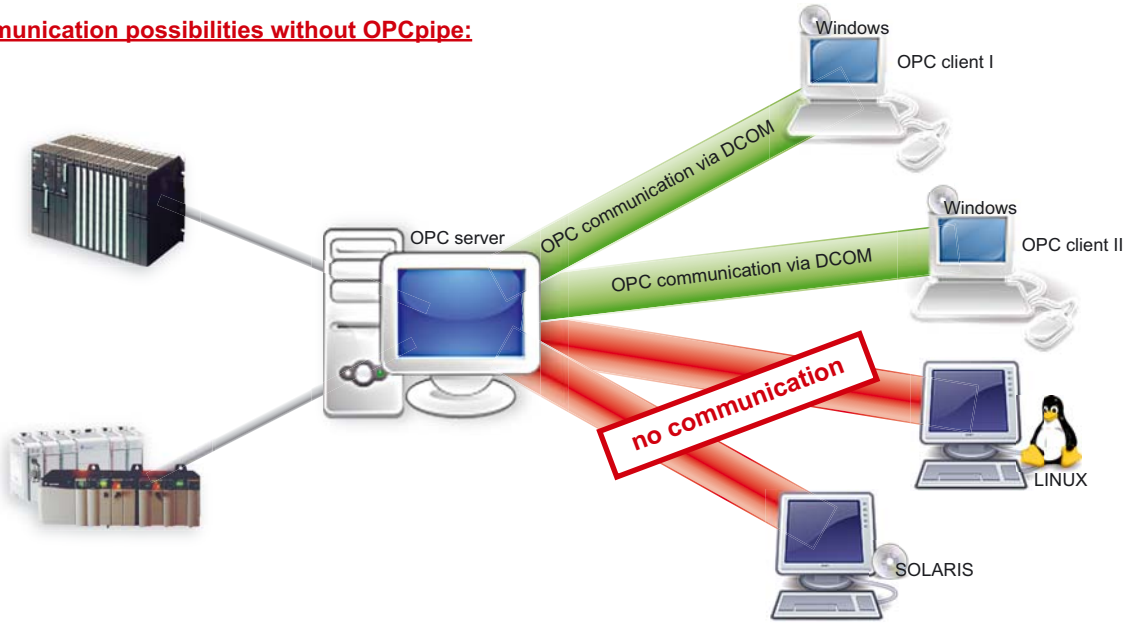
Easy remote access via internet

Communication via only one port

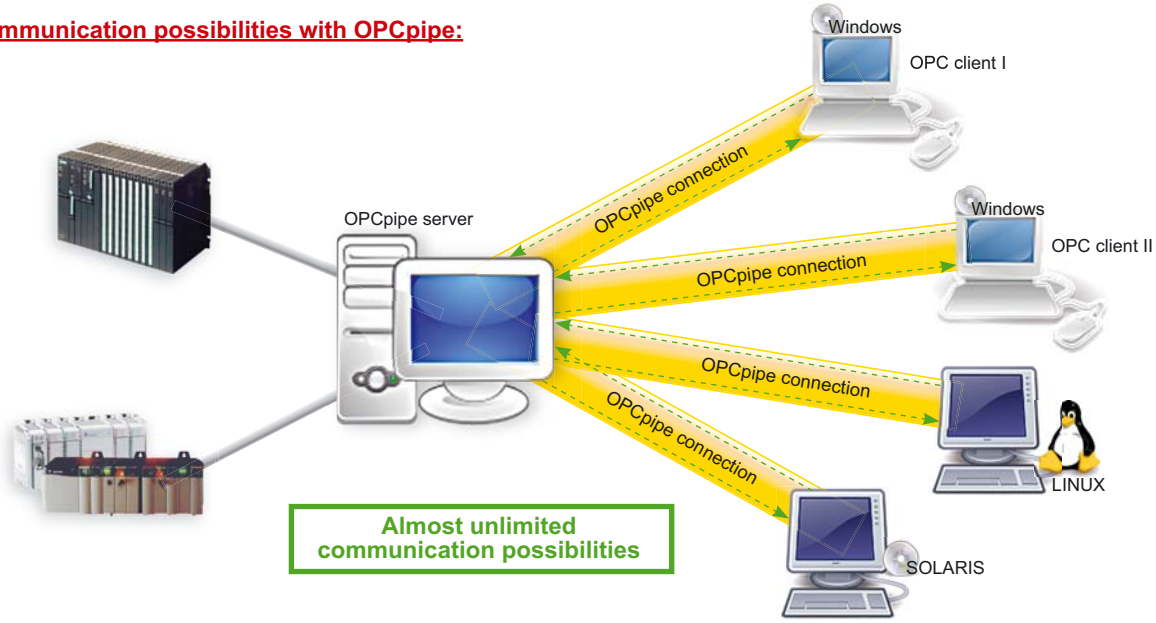
Supported OPC specifications:

- OPC DA (Data Access) 1.0 / 2.0 / 2.05 / 3.0

Communication possibilities without OPCpipe:



Communication possibilities with OPCpipe:



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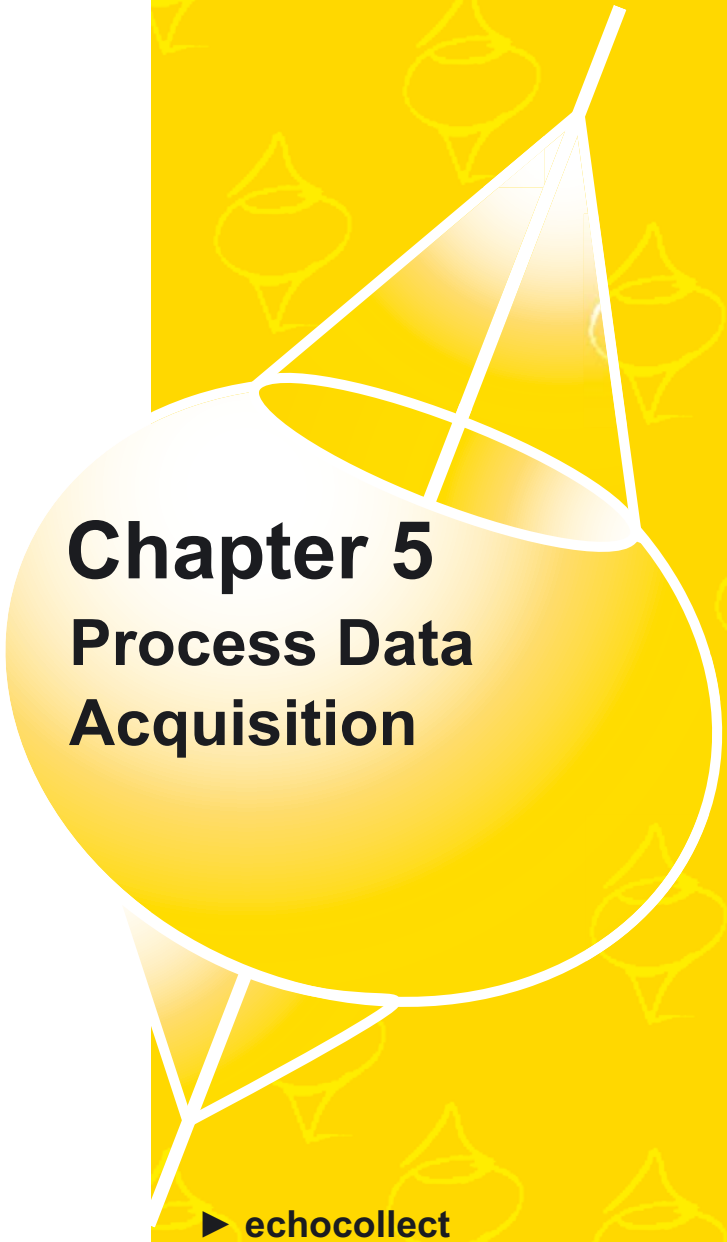
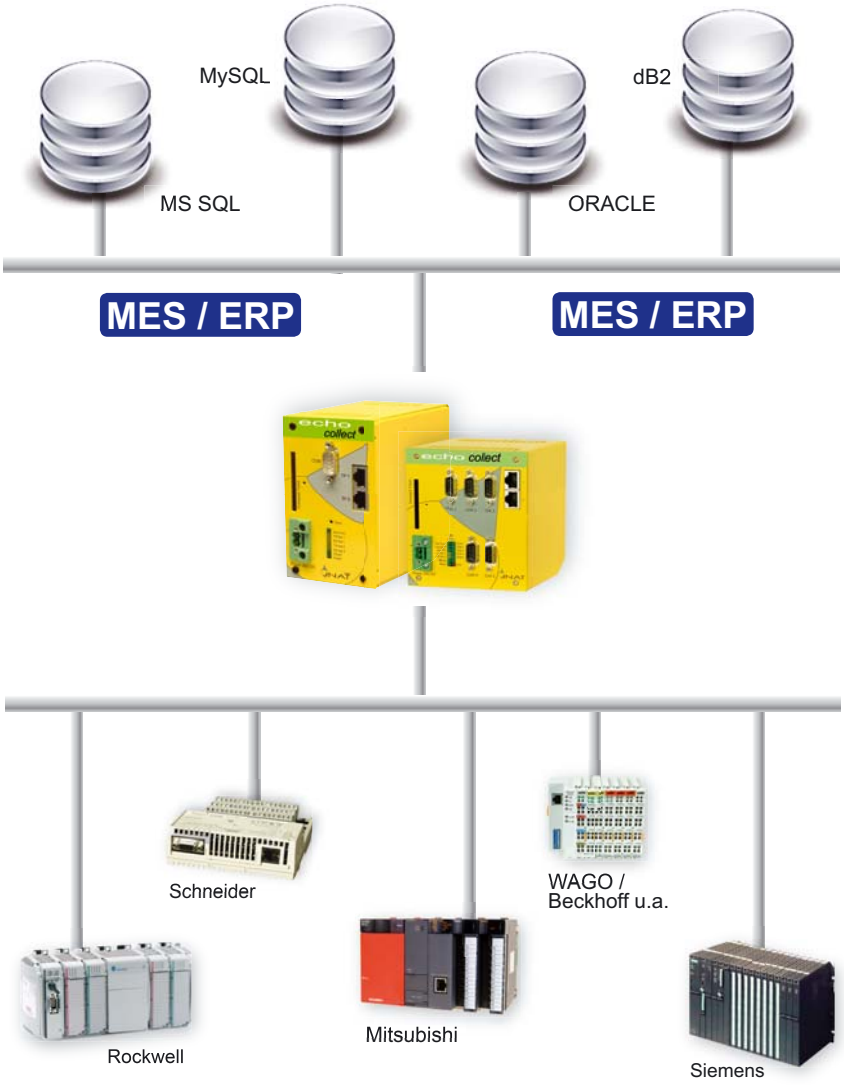


Chapter 5
Process Data Acquisition

► echocollect

echocollect

provides process data to superordinate systems



Store information, without changing the PLC

- **Condition monitoring**
- **OEE compliant***
- **Reliable traceability**
- **TPM****

*Overall equipment effectiveness: is a hierarchy of metrics which focus on how effectively a manufacturing operation is utilized.
**Total Productive Maintenance

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Applications:

- **PLC ⟷ PLC** (Data collector, PLC head)
- **Data base** (MySQL, MS-SQL, Oracle, dB2, ODBC) ⟶ **PLC**
- **PLC** (Siemens, Rockwell, Schneider, Beckhoff, Phoenix) ⟶ **Data base**
- **Measurement data logging and Backup**
  independent from existing solutions
- **PLC ⟷ Data** (Data collector, logger)
  .csv analysis (Excel) / integration main computer / data base

- **Recipe administration**
- **time-controlled data safety**
  (layer-related AG trigger)
- **Measurement and threshold control**
- **Remote maintenance**
  (safe dial-in node **VPN**, independent from used PLC)
- **Web server function**
  for visualization of measured data
- **Communication logger**
  (shows activity and failure on IT- or PLC side)
  Allocation of responsibility
- **IT function** (FTP, Telnet)
  for creating diagrams

Communication with following PLCs:

- Siemens (AS511, 3964R, H1, MPI, RFC1006)
- Rockwell (CIP, EtherNet/IP, CSP)
- Schneider (Modbus RTU, Modbus on TCP)
- Beckhoff, Phoenix (Modbus on TCP)
- Mitsubishi (Melsec-Q)

Data capture without changing PLC programs:

- plant errors, operating conditions, downtimes
- capturing of characteristics
- calculation of stocks, rejects, weak spots
- utilization of capacity
- IO- / NIO parts, quantities
- order maintenance and recipe handling
- total currency of engines
- traceability, revaluation

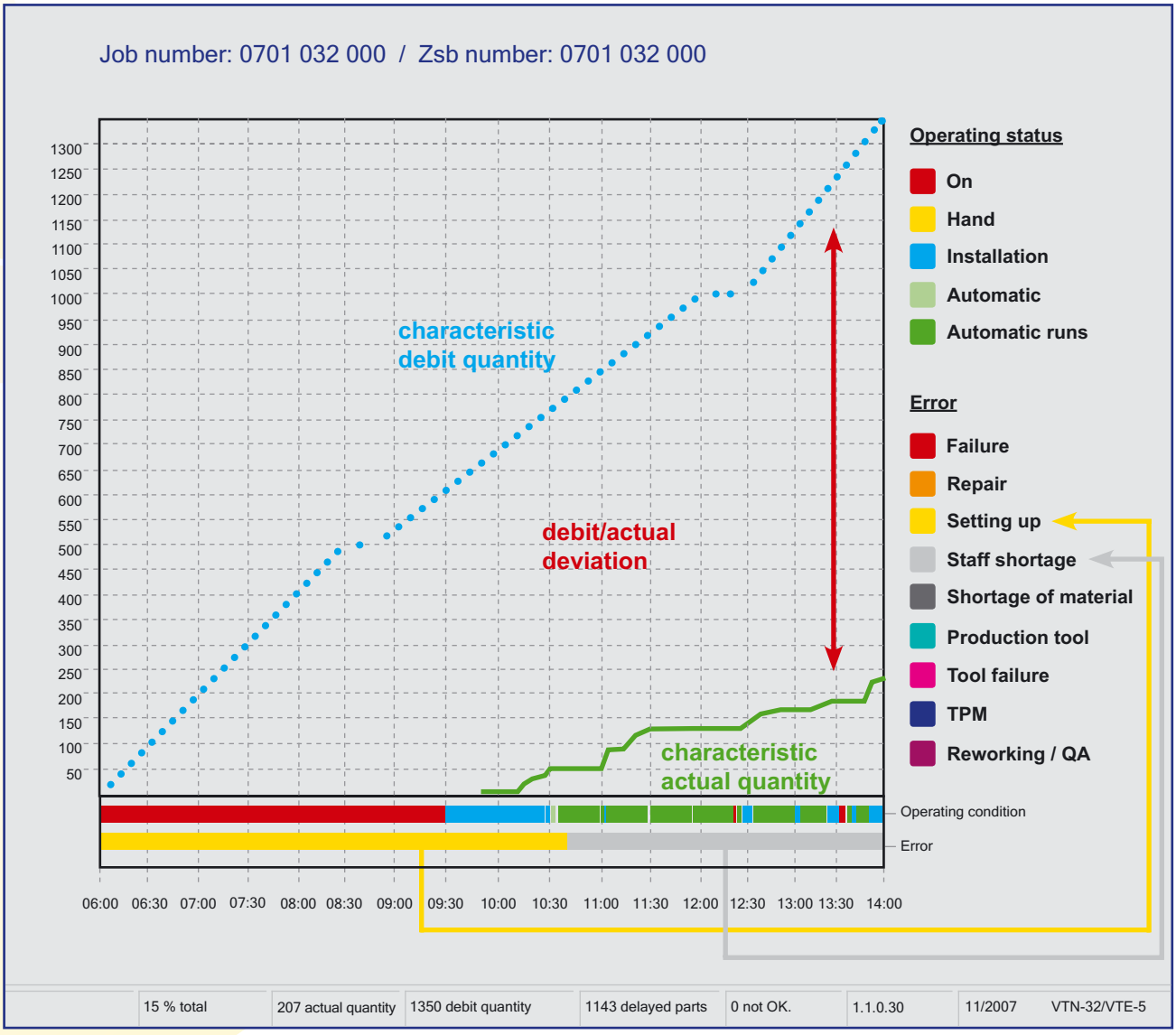


Figure: Quantity graph

Order data:

echocollect e (Ethernet) *
Order No.: 200-7000-01

echocollect r (Rockwell) *
Order No.: 200-7200-01

Note:
► only connection of Ethernet components possible
► no expansion of interfaces possible

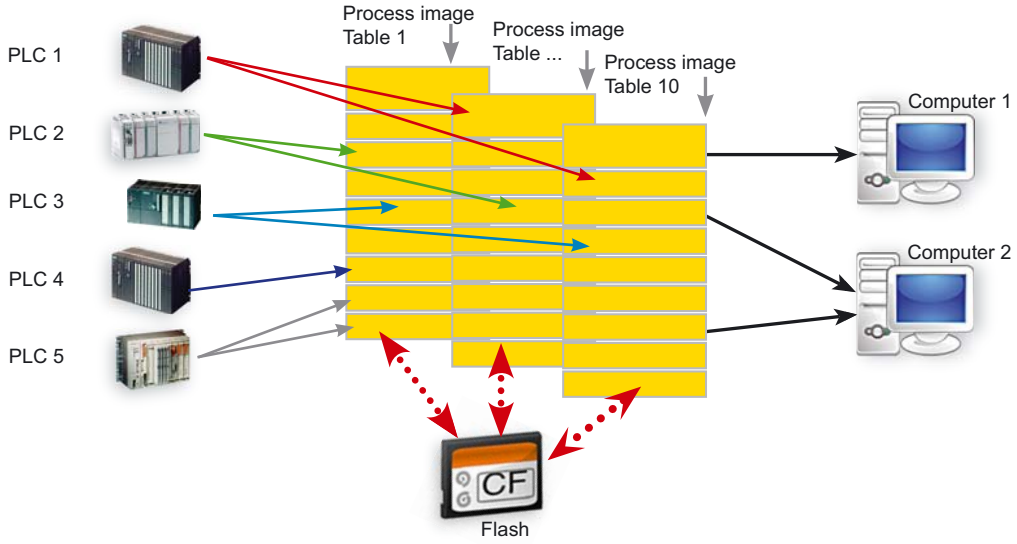
echocollect se (Serial and Ethernet) *
Order No.: 200-7100-01

echocollect se (Serial and Ethernet) *
Order No.: 200-7100-01

Note:
► up to 5 serial interfaces

*Standard: incl. MySQL database access, incl. 1 GB CF Card (Industrial grade), 10 tables, max. 5 PLCs with 50 Items

MULTIPLE IMAGES, MULTIPLE HOST COMPUTERS



Options:

Oracle database access	Order No.: 200-7910-02
dB2 database access	Order No.: 200-7910-04
MS-SQL database access incl. Sybase database access	Order No.: 200-7910-05
PLC visualization and program access	Order No.: 200-7900-01
S5 PLC backup	Order No.: 200-7920-01

Upgrade table size (100 tables, max. 100 items)	Order No.: 200-7930-01
Upgrade table size (200 tables, max. 200 items)	Order No.: 200-7930-02
Upgrade Flash, Logger incl. 8 GB CF Card (IG)	Order No.: 200-7930-03
Protocol license (Protocols: H1, CIP, COMLI, NITP, PSG, K-Sequence,)	Order No.: 200-7950-01
Connector Power Pack, Euro	Order No.: 700-5596-01
3-day Initial start-up package	Order No.: 120-1050-01

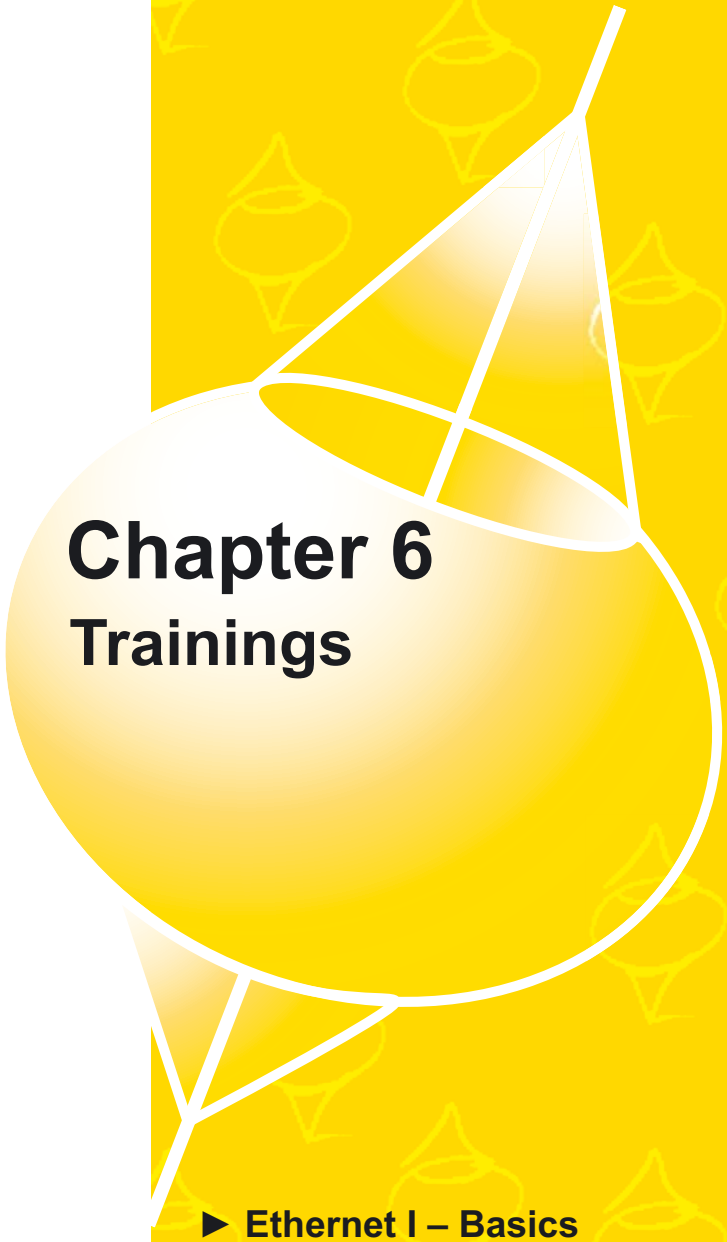
Stand: 03.2009

Expansion for echocollect:

1 x TTY (20mA)	Order No.: 200-7110-01
2 x TTY (20mA)	Order No.: 200-7110-02
3 x TTY (20mA)	Order No.: 200-7110-03
4 x TTY (20mA)	Order No.: 200-7110-04
5 x TTY (20mA)	Order No.: 200-7110-05
1 x RS232	Order No.: 200-7130-01
2 x RS232	Order No.: 200-7130-02
3 x RS232	Order No.: 200-7130-03
4 x RS232	Order No.: 200-7130-04
5 x RS232	Order No.: 200-7130-05

MPI	Order No.: 200-7120-01
1 x RS485 non-floating	Order No.: 200-7140-01
2 x RS485 non-floating	Order No.: 200-7140-02
3 x RS485 non-floating	Order No.: 200-7140-03
4 x RS485 non-floating	Order No.: 200-7140-04
1 x RS422 non-floating	Order No.: 200-7150-01
2 x RS422 non-floating	Order No.: 200-7150-02
3 x RS422 non-floating	Order No.: 200-7150-03
4 x RS422 non-floating	Order No.: 200-7150-04

Note:
► Up to two MPI interfaces are possible
► Up to four RS485 interfaces are possible
► With RS422-/RS485-/TTY interfaces up to two RS232 interfaces can be added
► Combinations incl. RS422-, RS485- und TTY interfaces are not possible

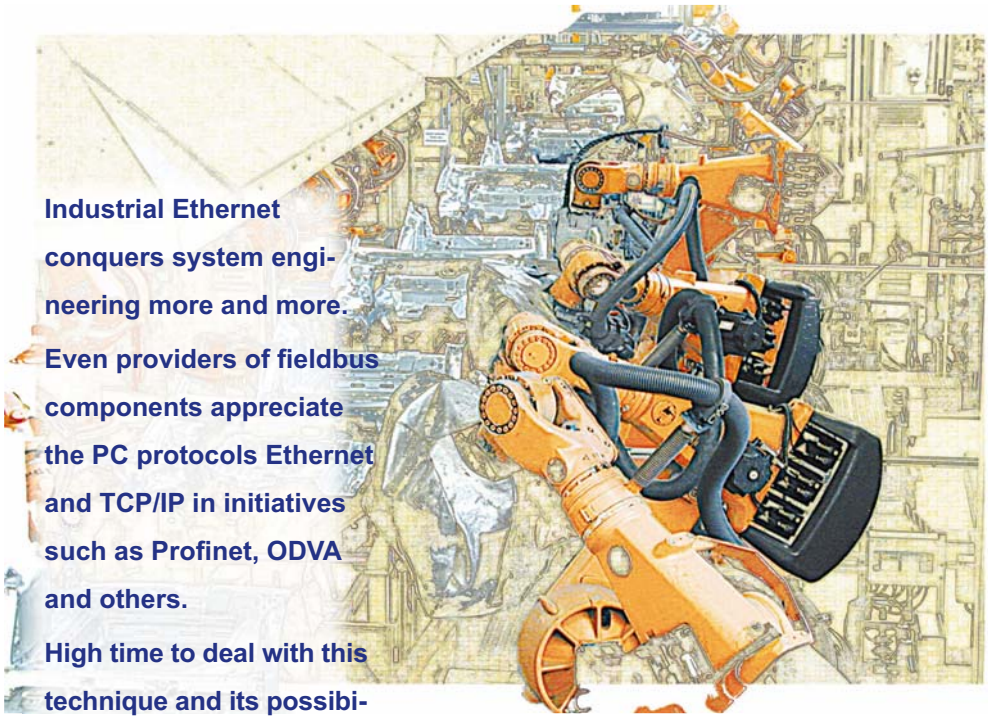


Chapter 6
Trainings

- ► Ethernet I – Basics
- ► Ethernet II – Troubleshooting
- ► Realtime Ethernet
- ► OPC Plug 'n' Play
- ► Wireless LANs
- ► Modernization of S5 PLCs

Seminar: Ethernet I –
Basics of industrial networking

3-day seminar with theory and practice



Industrial Ethernet conquers system engineering more and more. Even providers of fieldbus components appreciate the PC protocols Ethernet and TCP/IP in initiatives such as Profinet, ODVA and others. High time to deal with this technique and its possibilities.

Contents and goals:

The training is for employees in the field of design, project planning and maintenance, who want to connect their S7/S5 and other PLCs via Ethernet. You will be able to activate your Ethernet linked system in short time. In case of an error you will be able to locate and solve it fast.

In the first part of the training you will get an overview about the topic **Ethernet TCP/IP** and its meaning for automation. By building up an exercise network you will get to know the **basics of network engineering** in general as well as the **components of an industrial network** in particular.

Outlooks on the latest trends like the discussion about **„Ethernet as a fieldbus“** will close the part of the training which deals with networks.

The PLC workshop focuses on **Ethernet communication with S7 and S5 PLCs**. How do I build an effective communication? What is the best way to debug? Which tools are avaible?

Topic overview:

- **Ethernet workshop**
  - Components of an industrial network
  - Design of a TCP/IP network with PCs and PLCs
  - Ethernet basics
  - TCP/IP protocol family
  - Networking exercises
- **PLC networking workshop**
  - Theory of PLC networking
  - Ethernet communication with S7/S5
  - Connection parameterization of the PLC by using the protocols TCP/IP, H1 and RFC1006
  - Establish a Send/Receive communication between S7 and S5 PLCs
  - Establish a Fetch/Write communication between client and S7 via OPC
- **Troubleshooting**
  - Methodical search for faulty communication
  - Telegram analysis through netrecords of the existing communication
  - Insert of helpful network tools
  - Insert of the protocol analyser INAT NetSpector
- **Outlooks on Ethernet in automation**
  - Realtime Ethernet
  - Adaption of Ethernet to the structural conditions in automation

Ethernet Seminar in automation

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www.inat.de

INAT Industrial Networks for Automation Technology

Special characteristics:

- **Performances**
  - 3-day training with theory and practice part
  - Seminar documents
  - Seminar documents and network tools on CD
  - Certificate of participation
  - Lunch and coffee breaks
  - Training language: English or German
- **Requirements**
  - Basic PC knowledge

Learn in small groups:

In our seminars you are not just one number among many others. In order to provide an ideal learning atmosphere, the seminars are limited to a number of 8 participants. This guarantees a comprehensive, personal support, so that no question remains unanswered.

You'll say it too:
„Yes, when it comes to Industrial Ethernet I'm 100% fit"

Further seminars at INAT

- **INDUSTRIAL ETHERNET**
  - Ethernet II: Troubleshooting in area networks
  - Real-Time-Ethernet in automation
- **PROFIBUS**
  - PROFIBUS – Technology
  - PROFIBUS – Troubleshooting
- **PROFINET**
  - PROFINET – Technology
  - PROFINET – Certified Engineer
- **MODERN COMMUNICATION**
  - OPC Plug´n´ Play in automation
  - OPC-User-Training
  - OPC-Manufacturer-Training
  - OPC Unified Architecture
  - Wireless LANs in automation
- **AROUND PLC**
  - Modernization of S5 PLCs

In-house training:

If you would like to have a training at your company, feel free to ask. We will create a customized offer for you.

current dates on www.inat.de

Order data:

Ethernet I: Basics of Industrial Networking

3-day seminar

Nuremberg / Person Order No.: 110-1000-01

Stand: 02.2009

Seminar: Ethernet II Troubleshooting

2-day seminar: Troubleshooting in Industrial Ethernet

Contents and goals:

The training is for employees in the field of design, project planning and maintenance, who want to work with industrial Ethernet and TCP/IP. In case of an error you will be able to locate effects fast and solve them in short time.

With the help of an exercise network with working S7 and S5 communications you will get to know the common protocols used in automation: TCP/IP, ISO (H1), S7, S5, RFC1006 etc.

Furthermore you will get insight of the mode of operation of wide spread network services like SNMP, FTP, DHCP etc.

Error scenarios of Ethernet communnication with S7 and S5 PLCs and network errors in general are in the focus of the troubleshooting workshop. You will learn the following:

- How do I procede clever with fault analysis?
- Which tools are avaible for me?
- How do I use a network analyser efficiently?

Topic overview:

► Function of protocols & services

- Ethernet
- TCP/IP, ISO on TCP (RFC1006), Modbus on TCP
- ISO (H1)
- FTP, HTTP, DNS, DHCP, SNMP

► Functioning of the INAT NetSpector

- Overview of functions
- Interpretation of statistics
- Filter possibilities
- Automatical recording
- Application of triggers

► Troubleshooting

- Fault analysis in Send / Receive Direct communication between S7 and S5 PLCs
- Fault analysis in Fetch / Write communication between client and S7 or OPC
- Fault analysis in connection to higher ranked services
- Typical as well as rare error scenarios are run through

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www.inat.de

Special characteristics:

- **Performances**
  - 2-day seminar with theory and practice part
  - Seminar documents
  - Seminar documents and network tools on CD
  - Certificate of participation
  - Lunch and coffee breaks
  - Training language: English or German
- **Requirements**
  - Seminar: Ethernet I – Basics or similar
  - Basic PC knowledge

Learn in small groups:

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You'll say it, too:
„Yes, I am 100% fit when it comes to Industrial Ethernet"

Further seminars at INAT

- **INDUSTRIAL ETHERNET**
  - Ethernet I: Basics
  - Real-Time-Ethernet in automation
- **PROFIBUS**
  - PROFIBUS – Technology
  - PROFIBUS – Troubleshooting
- **PROFINET**
  - PROFINET – Technology
  - PROFINET – Certified Engineer
- **MODERN COMMUNICATION**
  - OPC Plug´n´ Play in automation
  - OPC-User-Training
  - OPC-Manufacturer-Training
  - OPC Unified Architecture
  - Wireless LANs in automation
- **AROUND PLC**
  - Modernization of S5 PLCs

In-house training:

If you would like to have a training at your company, feel free to ask. We will create a customized offer for you.

Current dates on www.inat.de

Order data:

Ethernet II: Troubleshooting in Industrial Ethernet

2-day seminar,

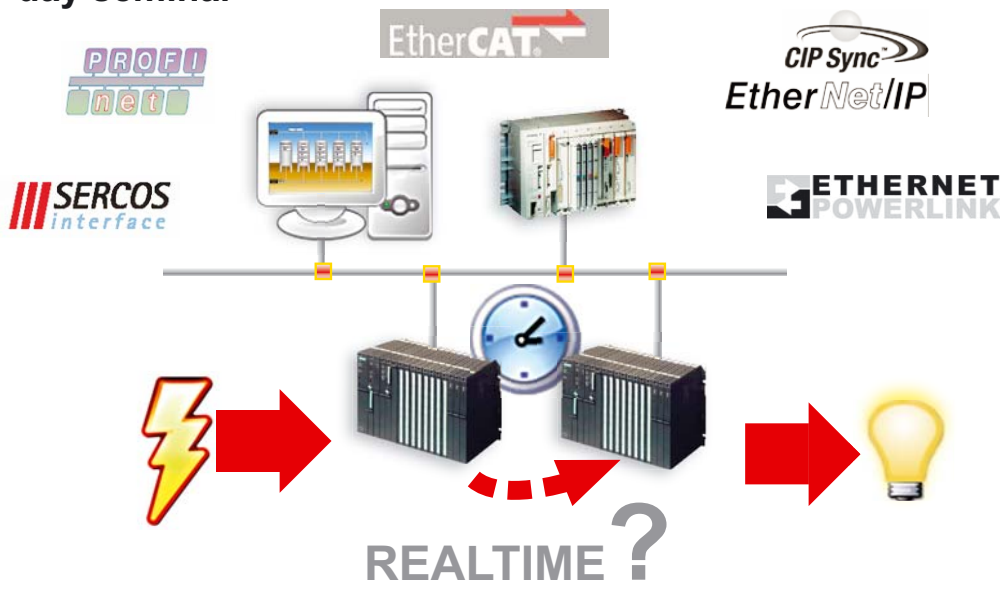
Nuremberg / Person Order No.: 100-2290-02

Stand: 02.2009

Realtime Ethernet in Automation

Ethernet as Fieldbus? Seminar

1-day seminar



The chances and options with Ethernet are nearly unlimited. It is no surprise that it became accepted as the standard in the office world as well as in great parts of the industry. But Ethernet as fieldbus? What an attractive idea. All possibilities of modern office communication become applicable in production.

For a long time that seemed utopistic because of the lack of realtime capability of the classical Ethernet. First solutions, that based on Ethernet and at the same time complied the requirements for realtime were already presented in 2003.

But what is realtime Ethernet exactly? Powerlink, EtherCat, Sercos-III, Varan, Profinet or another of the many avaible systems? What are the differences and which organisation stands behind it? Are there convincing advantages compared to fieldbusses and are these products already avaible?

Contents and goals:

The one day workshop „Realtime-Ethernet in automation“ is for employees in planning, projecting and maintenance, that stand in front of the question: „Which real-time Ethernet fits the best to my tasks?“

Independent from manufacturer names the course offers an overview of the avaible solutions and there technical base.

The training is a well compiled mix of theory and practise. It mediates effectively background knowledge and shows the five most important realtime Ethernet systems in comparison.

Application examples show which possibilities already exist and what else is to expect in the future.

Topic overview:

- **What is realtime?**
  - Realtime in theory (definition)
  - Realtime in practise
  - Realtime in shared systems
  - Quality categories and parameters
- **Why does classical Ethernet not work in realtime?**
  - Media access and infrastructure components
  - examples
- **Overview of the current solutions**
  - Goals of realtime Ethernet systems
  - Application in practise
  - Norming stage
- **Realtime Ethernet systems in detail**
  - PROFINET
  - EtherNet/IP
  - Ethernet Powerlink
  - EtherCAT
  - SERCOS III
- **Application**

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INAT Industrial Networks for Automation Technology

Special characteristics:

- **Instructor**

  Certified engineer Andreas Pfeiffer has worked for years in international norming groups among others on the fieldbus standard IED 61158 and realtime Ethernet standard IEC 61784-2. He is able to report at first hand.

- **Performances**
  - Training documents
  - CD-ROM with training documents
  - Certificate of participation
  - Lunch and coffee breaks
  - Training language: English
- **Requirements**
  - Basic knowledge in automation engineering
  - Previous knowledge of Ethernet

Learn in small groups:

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Trainer

DI Andreas Pfeiffer

Further seminars at INAT

- **INDUSTRIAL ETHERNET**
  - Ethernet I: Basics
  - Ethernet II: Troubleshooting in area networks
- **PROFIBUS**
  - PROFIBUS – Technology
  - PROFIBUS – Troubleshooting
- **PROFINET**
  - PROFINET – Technology
  - PROFINET – Certified Engineer
- **MODERN COMMUNICATION**
  - OPC Plug´n´ Play in automation
  - OPC-User-Training
  - OPC-Manufacturer-Training
  - OPC Unified Architecture
  - Wireless LANs in automation
- **AROUND PLC**
  - Modernization of S5 PLCs

In-house training:

If you would like to have a training at your company, feel free to ask. We will create a customized offer for you

Order data:

1-day seminar	
Nuremberg / Person	Order No.: 110-1500-01

Stand: 02.2009

Seminar:
OPC Plug´n´ Play in Automation

2-day seminar with theory and practice

Contents and goals:

The training is for engineering executives and project leaders that have already had first experiences with OPC technology or plan the application of OPC in an automation area in the future.

You will receive an overview of the OPC technology and its meaning in automation. OPC extensions such as Alarm & Event or currently intensely discussed OPC & XML are being described and classified.

During the practice part communication possibilities of OPC technology via Ethernet will be explained using typical OPC products such as e.g. visualization.

By establishing an OPC communication with S7 / S5 PLCs the configuration of the client and the server respectively will be shown.

An introduction to the development of a simple OPC Client with Visual basic, for connections to various data bases (Access) and/or for visualization of data, caps off the practical part of the seminar.

Topic overview:

- **Introduction to OPC**
  - OLE for Process Control
  - OPC foundation, activities
- **Basics of OPC**
  - Overview OPC specifications
  - OPC components (Client, Server)
  - Data Access 1.0 to 2.05
  - Alarm & Event
  - Historical batch data
  - Forecast: OPC, XML and OPC DX
- **OPC Performance**
  - Speed of the OPC communication
  - What will affect the performance?
- **OPC in Practice**
  - Configuration of Simatic.NET OPC Server
  - Configuration of INAT OPC Server
  - DCOM Configuration
- **OPC Interface**
  - Interfaces and methods of the interface specification OPC Data Access
  - Basics of programming OPC clients for the Automation Interface using Visual Basic
  - Tips to improve performance when accessing the OPC interface
- **Workshop: OPC Client Programming**
  - Typical development of an OPC client
- **Troubleshooting**
  - Diagnostic possibilities
  - Methodical search for faulty communication
  - Troubleshooting and elimination

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Industrial Networks for Automation Technology

Special characteristics:

► **Performances**

- Two day training with theory and practice part
- Training documents
- CD-ROM with OPC specification version 2.05 and complete Visual Basic (.Net) examples
- Certificate
- Lunch and coffee breaks
- Training language: English

► **Requirements**

- PC knowledge
- Basic knowledge of programming
- Basic knowledge of Visual Basic

Learn in small groups:

In our seminars you are not just one number among many others. In order to provide an ideal learning atmosphere, the seminars are limited to a number of 8 participants. This guarantees a comprehensive, personal support, so that no question remains unanswered.

After these 2 days the participants are able to appraise every OPC Server or Client and start them up.

Further seminars at INAT

► **INDUSTRIAL ETHERNET**

- Ethernet I: Basics
- Ethernet II: Troubleshooting in area networks
- Real-Time-Ethernet in automation

► **PROFIBUS**

- PROFIBUS – Technology
- PROFIBUS – Troubleshooting

► **PROFINET**

- PROFINET – Technology
- PROFINET – Certified Engineer

► **MODERN COMMUNICATION**

- OPC-User-Training
- OPC-Manufacturer-Training
- OPC Unified Architecture
- Wireless LANs in automation

► **AROUND PLC**

- Modernization of S5 PLCs

In-house training:

If you would like to have a training at your company, feel free to ask. We will create a customized offer for you.

current dates on www.inat.de

Order data:

OPC Plug´n´Play in Automation

2-day seminar

Nuremberg / Person Order No.: 100-1030-01

Stand: 02.2009

Seminar: Wireless LANs in Automation

2-day seminar with theory and practice

Contents and goals:

The training is for employees from planning, design and maitenance who intend to build wireless networks or want to integrate wireless components into an existing network. You will get an overview about the topic WLANs and get to know a lot of WLAN components during the workshop.

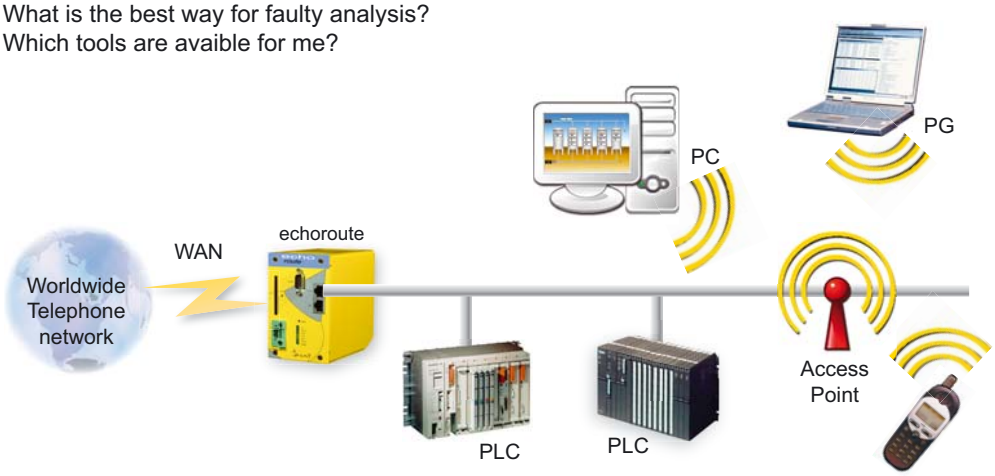
With an exercise wireless network communication to the S7- and S5 PLCs you will get to know the advantages and disadvantages of the use of WLAN technologies in the automation area.

The workshop is about establishing WLANs according to 802.11 specification and spotting failure scenarios all around Ethernet communication in the wireless network.

What is the best way for faulty analysis? Which tools are avaible for me?

Topic overview:

- **Introduction WLANs**
  - getting started
  - WLAN and other wireless technology
  - legal basis
- **Network types**
- **Physical base**
  - transmitting media
  - 802.11 standards
  - Frequence-Hopping technology
  - Direct-Squence-technology
- **Increase of range - antennas**
- **TCP/IP and Wireless LAN**
  - Roaming
  - MobileIP
  - TCP/IP in the WirelessLAN
- **Network analysis in wireless LAN**
- **Troubleshooting in wireless networks**
- **Security of wireless networks**
- **Industrial use of WLAN**
- **Future trends in WLANs**



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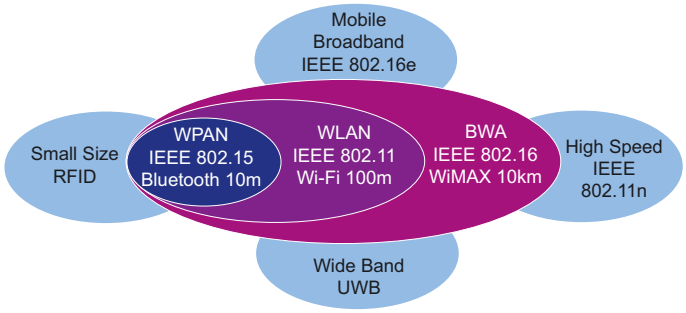
Special characteristics:

- **Performances**
  - Seminar documents
  - Seminar documents and network tools on CD
  - Certificate of participation
  - Lunch and coffee breaks
  - Training language: English or German
- **Requirements**
  - Completion of „Ethernet I“ seminar
  - Basic PC knowledge and S5 / S7



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Wireless into the future
– INAT shows you the way

Further seminars at INAT

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  - Ethernet II: Troubleshooting in area networks
  - Real-Time-Ethernet in automation
- **PROFIBUS**
  - PROFIBUS – Technology
  - PROFIBUS – Troubleshooting
- **PROFINET**
  - PROFINET – Technology
  - PROFINET – Certified Engineer
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  - OPC-User-Training
  - OPC-Manufacturer-Training
  - OPC Unified Architecture
- **AROUND PLC**
  - Modernization of S5 PLCs

In-house training:

If you would like to have a training at your company, feel free to ask. We will create a customized offer for you.

Order data:

Wireless LANs in Automation	
2-day seminar	
Nuremberg / Person	Order No.: 100-1080-01

Stand: 02.2009

Seminar: Modernization of S5 PLCs

Upgrade Seminar Retrofit

2-day PLC seminar with theory and practice

Contents and goals:

The course is for employees from planning, project design and maintenance who are interested in alternatives to the extensive change over of plants from S5 to S7 PLCs.

With various examples of SPS programs you will learn which aspects should be considered while implementing into X5/X7.

Which similarities and which differences are there between X5/S5 and X7/S7 CPUs?

You will gain insight the functioning of the RS5/RS7 software and learn on what kind of different platforms an „S5“ could be operated with.

You will learn that modules from the S5 program don‘t have to be reprogrammed in order to change over from S5 to S7 but how the S5 programs are accessed in a STEP 7 program.

Topic overview:

- Similarities of a Siemens CPU and a X5 with RS5/7 Flash
- Differences between a Siemens CPU and a X5 with RS5/7
- Connection options of Profibus, Interbus and L1-Bus on a X5 with RS5/7
- External modules in the S5 Rack
- Examples, exercises
- Decision criteria for the implementation of an existing S5 program
- Implemantation of PLC programs of the CPUs 922 to 946/947 into an X5 with RS5
- Communication with guide systems / visualizations and with other PLCs
- Operation of multi-processors in X5 with RS5

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INAT
Industrial Networks for Automation Technology

Special characteristics:

- **Performances**
  - Training documents
  - CD-ROM with training documents and network tools
  - Certificate
  - Lunch and coffee breaks
  - Training language: English or German
- **Requirements**
  - Ethernet TCP/IP I Basics
  - Basic PC and S5/S7 knowledge

Learn in small groups:

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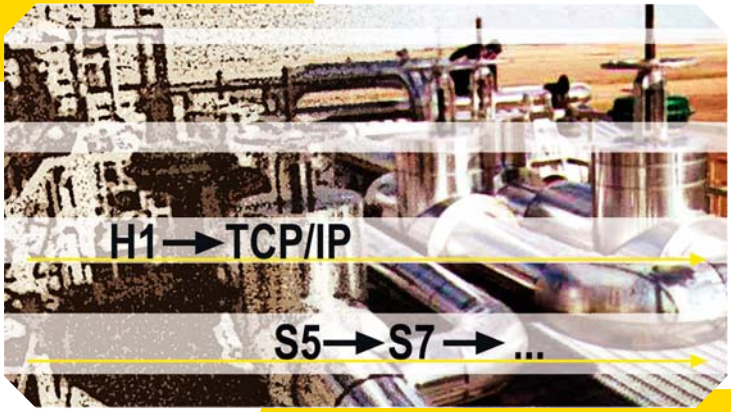


Overview in the jungle of modernization

Further seminars at INAT

- **INDUSTRIAL ETHERNET**
  - Ethernet I: Basics
  - Ethernet II: Troubleshooting in Anlagennetzen
  - Echtzeit-Ethernet in der Automatisierung
- **PROFIBUS**
  - PROFIBUS – Technologie
  - PROFIBUS – Troubleshooting
- **PROFINET**
  - PROFINET – Technologie
  - PROFINET – Certified Engineer
- **MODERN COMMUNICATION**
  - OPC Plug´n´ Play in automation
  - OPC-User-Training
  - OPC-Manufacturer-Training
  - OPC Unified Architecture
  - Wireless LANs in automation

In-house training:

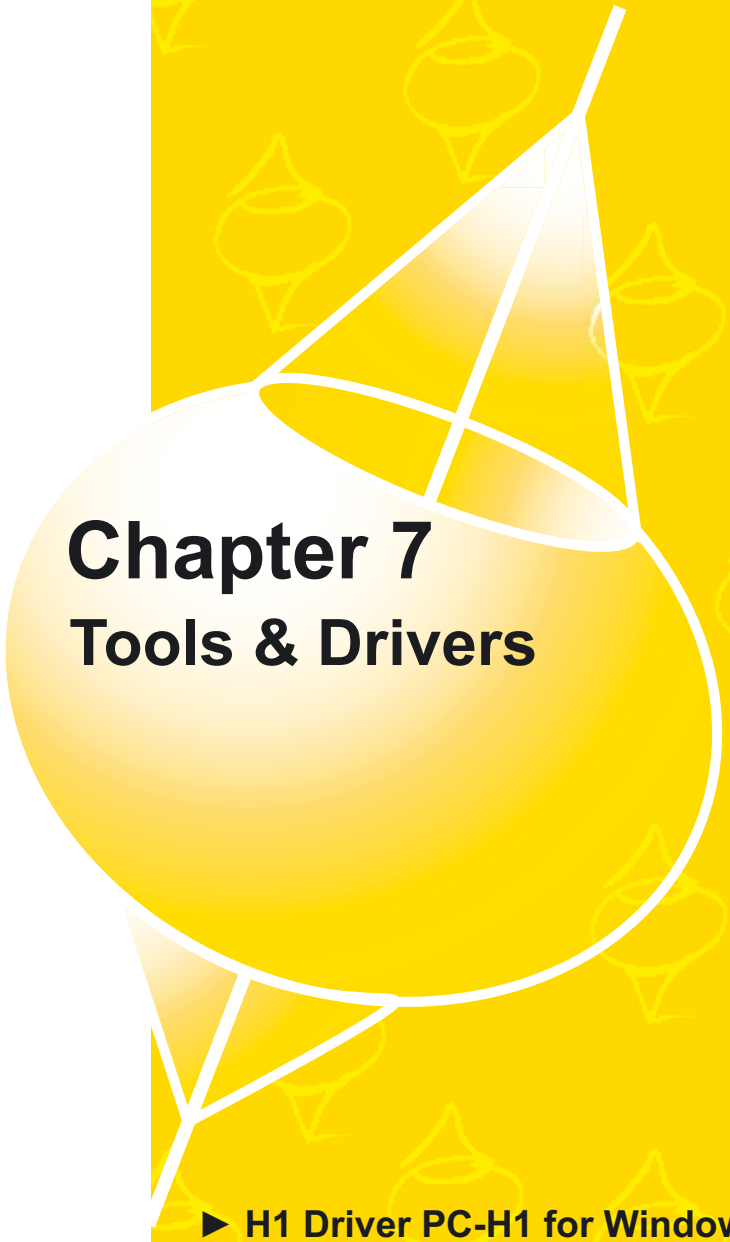
If you would like to have a training at your company, feel free to ask. We will create a customized offer for you.

Current dates on www.inat.de

Order data:

Modernization of S5 PLCs	
2-day seminar,	
Nuremberg / Person	Order No.: 110-1100-01

Stand: 02.2009



Chapter 7
Tools & Drivers

- ► H1 Driver PC-H1 for Windows
- ► H1 Driver PC-H1 for Linux
- ► MPI/PPI-DLL
- ► Virtual ComPort VCOM

H1 - driver and interface

H1 driver for PC-H1 PCs

You want to integrate your PCs/ IPCs into an ISO (H1) network in order to communicate with S7 and S5 PLCs?

The PC H1 Driver package makes this possible! In addition to the transport protocol ISO (H1), the S7 and S5 protocols are also implemented. Through that numerous possibilities are avaible via ISO (H1) networks: programming, visualization, capturing of process data, own applications...

Characteristics:

- No special network interface card required: PC-H1 can be operated with any Ethernet adaptor
- Easy application
  - Driver packets and applications are easy to create because the tool is designed as a language-independent library (DLL)
  - Included in delivery you will find example programs that will make your first step in application easy
  - Routines for Fetch / Write and Send / Receive
- Direct access to the following PLC elements
  - Data blocks
  - Flags
  - Inputs
  - Outputs
  - Periphery
  - Counter
  - Timer
  - System data
- Operating systems
  - Win 98 / ME / NT / 2000 / XP / 2003
- Test possibility
  - Free download of the H1 driver at www.inat.de
  - After every restart of your PC the driver is avaible for 10 hours

Test fist, then license!

At **www.inat.de** you can find a 10 hour trial version of the H1 driver

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Ostendstr. 50 A
90482 Nuremberg

Phone +49 911 544 27-0
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Email: info@inat.de

www.inat.de

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Routines:

► FUNCTIONS FOR COMMUNICATIONS BASED ON LAYER 4

GENERAL FUNCTIONS

- H1DriverOpen
- H1DriverClose
- H1GetVersion
- H1StartConnect
- H1StartConnectCard
- H1StopConnect
- H1TestStatus
- H1GetLineCaracteristics
- H1ListRunningConnections
- H1GetStationAddress
- H1GetStationAddressCard
- H1SetStationAddress
- H1SetStationAddressCard
- H1GetStandardValues
- H1SetStandardValues

SPECIFIC FUNCTIONS

- H1SendData
- H1StartSend
- H1PollSend
- H1SendDataEx
- H1ReadData
- H1StartRead
- H1PollRead
- H1ReadDataEx
- H1StartReadEx
- H1PollReadEx

► FUNCTIONS FOR COMMUNICATIONS BASED ON LAYER 7

CONNECTION HANDLING

- S5StartConnection
- S5StartConnectionCard
- S5StartConnectionH1
- S5StopConnection

SPECIFIC FUNCTIONS

- S5ReadFromPLC
- S5StartRead
- S5PollRead
- S5FetchPassiv
- S5StartFetchPassiv
- S5PollFetchPassiv
- S5WriteToPLC
- S5StartWrite
- S5PollWrite
- S5WritePassiv
- S5StartWritePassiv
- S5PollWritePassiv

Order data:

PC-H1: H1 driver and interface single-user licence, including test programs	Order No.: 100-4500-01
Upgrade	Order No.: 100-4500-Upg

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H1- driver and interface for Linux

H1 driver for LINUX PCs

You want to integrate your PCs/ IPCs into an ISO (H1) network in order to communicate with S7 and S5 PLCs?

The PC H1 Driver package makes this possible! In addition to the transport protocol ISO (H1), the S7 and S5 protocols are also implemented. Through that numerous possibilities are avaible via ISO (H1) networks: programming, visualization, capturing of process data, own applications...

Special features:

- No special network interface card required: PC-H1 can be operated with any Ethernet adaptor
- Easy application
  - Driver packets and applications are easy to create because the tool is designed as a language-independent library (DLL)
  - Included in delivery you will find example programs that will make your first step in application easy
  - Routines for Fetch / Write and Send / Receive
- Direct access to the following PLC elements
  - Data blocks
  - Flags
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Routines:

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- H1GetStationAddressCard
- H1SetStationAddress
- H1SetStationAddressCard
- H1GetStandardValues
- H1SetStandardValues

SPECIFIC FUNCTIONS

- H1SendData
- H1StartSend
- H1PollSend
- H1SendDataEx
- H1ReadData
- H1StartRead
- H1PollRead
- H1ReadDataEx
- H1StartReadEx
- H1PollReadEx

► FUNCTIONS FOR COMMUNICATIONS BASED ON LAYER 7

CONNECTIONS HANDLING

- S5StartConnection
- S5StartConnectionCard
- S5StartConnectionH1
- S5StopConnection

SPECIFIC FUNCTIONS

- S5ReadFromPLC
- S5StartRead
- S5PollRead
- S5FetchPassiv
- S5StartFetchPassiv
- S5PollFetchPassiv
- S5WriteToPLC
- S5StartWrite
- S5PollWrite
- S5WritePassiv
- S5StartWritePassiv
- S5PollWritePassiv

Order data:

PC-H1 for Linux: **H1 driver and interface single-user licence, including test programs**	Order No.: 100-4540-01
Upgrade	Order No.: 100-4540-Upg

Stand: 02.2009

MPI / PPI -DLL

Creating own applications for S7 PLCs

Access to the MPI/PPI DLL S7

You want to connect your applications with the Siemens S7? Use the existing routines!

With the MPI/PPI-DLL you realize the acces to the S7 via an MPI/PPI-Adapter.

Additional to the routines for Fetch/ Write there are example programs for the S7 access as sources included in the delivery also.

Characteristics:

- Data transfer
  - Synchronuous und asynchronuous mode possible
- Transmission rate
  - COM1 to COM4 can be used with rates up to 115200 baud
- Easy application
  - Driver packets and applications are easy to create because the tool is designed as a language-independent library (DLL)
  - Included in delivery you will find example programs that will make your first step in application easy
- Protocols
  - MPI for the acces to the S7-300/S7-400
  - PPI for access to the S7-200
- Direct access to the following PLC elements
  - Data blocks
  - Flags
  - Inputs
  - Outputs
  - Periphery
  - Counter
  - Timer
  - System data

Routines:

- Functions for communication with the SPS
  - MpiConnect
  - MpiStopConnection
  - MpiStopConnections
  - MpiGetStatus
  - MpiS7Init
  - MpiReadWait
  - MpiWriteWait
  - MpiStartConnection
  - MpiStartRead
  - MpiStartWrite
- Functions for communication with the adapter
  - MpiConnect
  - MpiGetFirmwareVersion
  - MpiAdapterIniGetVersion
  - MpiGetLifeList
  - MpiGetDirectConnected
  - MpiGoOffline

Order data:

MPI/PPI-DLL single user licence, including test programs	Order No.: 100-3380-01
Enterprise licence for each location of an enterprise	Order No.: 100-3381-01

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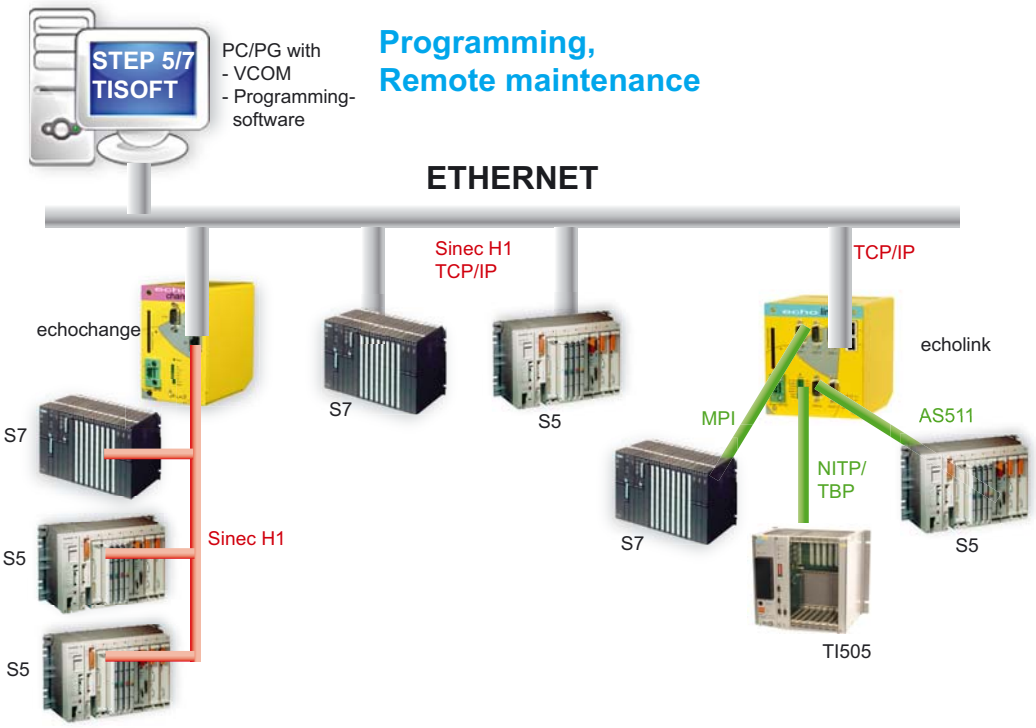
Virtual ComPort

Redirecting serial communication to the network interface card



Many software applications are designed exclusively for the serial interface. Running these applications via Ethernet is in many cases only possible with additional - mostly expensive - software or hardware. Virtual ComPort(VCOM) is the easy-to-use alternative at an affordable price.

Special features:

- Operate programs, which access to the serial interface, via the network
- Programming of the S7 and S5 with Step® 7 and Step® 5 via TCP/IP and Sinec H1 WITHOUT Softnet®
- Programming of PLCs that are connected to echolink in series
  - S7 PLCs (S7-400, S7-300 with Step® 7)
  - S5 PLCs with Step 5
  - TI PLCs with TISOFT
  - other PLCs via Telnet

Functioning:

- With VCOM serial application and configuration software becomes network-compatible.
- Additional virtual serial interfaces are being set up on the PG / PC. The application „sees“ these serial interfaces and uses them like a „real“ interface.
- If the application accesses to one of these virtual ports data is redirected automatically via network to the serial interface.

Technical characteristics:

- Ethernet protocols
  TCP/IP, ISO (H1)
- Serial protocols
  MPI, AS511, AEG Ks, TI505 (NITP/TBP), Telnet
- Provided PLCs
  S7-400®, S7-300®, S5, A 120, A 250
  Operation systems
  Win NT, 2000, XP

Order data:

Virtual ComPort VCOM
INAT hardware included in the delivery, no licensing needed

Telnet
Download: www.inat.de
Licence MPI, AS511, TI505; TCP/IP and H1
Order No.: 100-3400-02

Stand: 02.2009

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